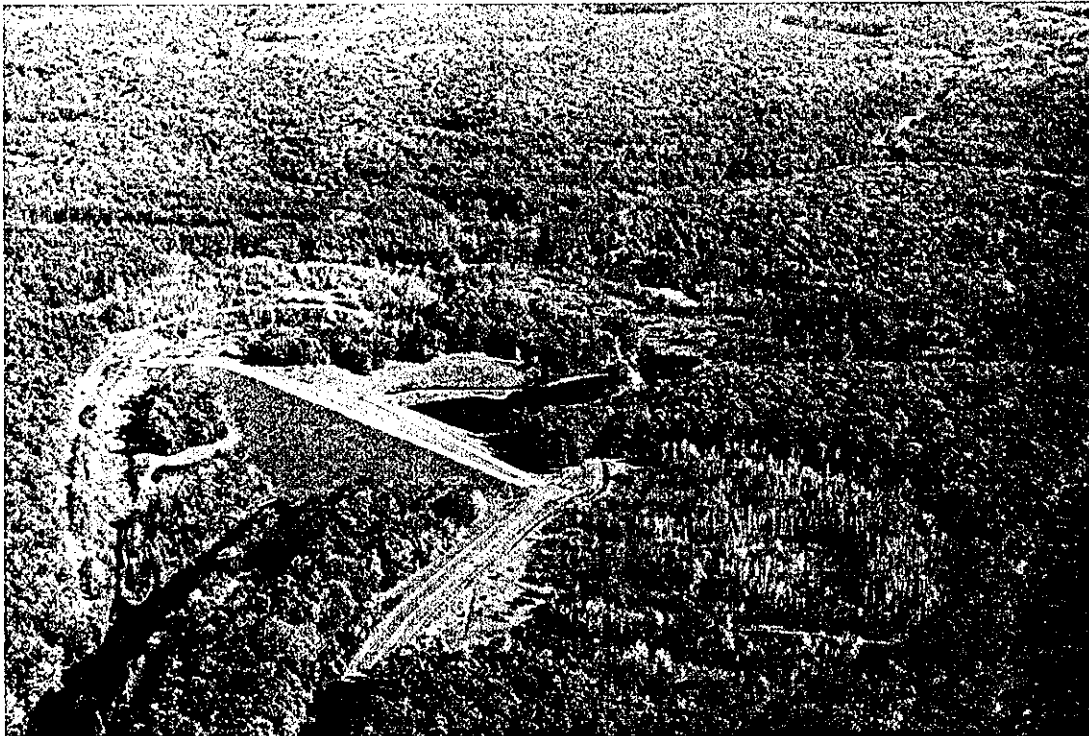


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# Master Plan

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## CONANT BROOK DAM Monson, Massachusetts



September 1998



US Army Corps  
of Engineers  
New England District

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23 September 1998  
Heidebrecht/kab/78513

MEMORANDUM FOR Commander

SUBJECT: Submittal of Master Plan - Conant Brook Dam, Monson, Massachusetts, dated September 1998

1. In accordance with ER 1130-2-550 (15 November 1996), district commanders are responsible for approving master plans, supplements, and updates.
2. The subject Master Plan is enclosed for your review and approval. The previous Conant Brook Dam Master Plan for Recreation Resources Development, Monson, Massachusetts, dated April 1979, is rescinded.
3. The Master Plan prescribes an overall land and water management plan, resource objectives, and associated design and management concepts that will provide the best combination of responses to regional needs, resource capabilities, and expressed public interest and desires consistent with the authorized flood control function of the Conant Brook Dam project.
4. The plan has been prepared in cooperation with the Construction/Operations Division, which concurs with the Master Plan.



ANTHONY T. MACKOS, P.E.  
Chief, Engineering/Planning Division

Encl

cf:  
Mr. Heidebrecht(doc:mpconbrk.wpd)  
Mr. Juhola, Bldg. 1  
Mr. Hanacek, TRB  
Eng/Plng Files, Bldg. 2


CENAE-DE 1st End

DATE:

FOR Chief, Engineering/Planning Division

MP Approved

\_\_\_\_\_ Disapproved



MICHAEL W. PRATT  
COL, EN  
Commanding

MASTER PLAN

CONANT BROOK DAM  
MONSON, MASSACHUSETTS

SEPTEMBER 1998



## EXECUTIVE SUMMARY

This Master Plan covers approximately 456 acres of Federally owned land at Conant Brook Dam. The Master Plan prescribes an overall land and water management plan, resource objectives, and associated design and management concepts which provide the best possible combination of responses to regional needs, resource capabilities and suitabilities, and expressed public interests and desires consistent with the project's authorized flood control purpose. The Master Plan covers all project resources, including but not limited to fish and wildlife, vegetation, cultural, aesthetic, interpretive, recreational, mineral, commercial, and outgranted lands, easements, and water.

Inputs to the planning process were surveys and management plans for natural, wetland and cultural resources, and an analysis of recreational use, capacity, and projected needs for project lands. Natural and man-made resources were located, identified, and analyzed, including wetlands, exemplary natural communities, and cultural resources that require specific management efforts for their protection. These were integrated into a series of project wide and specific objectives to protect and enhance project resources, and promote and develop, as appropriate, those resources for public use, education, and access.

Recreational opportunities were identified through an analysis of regional needs, and the public participation process. This planning process identified opportunities for the improvement and extension of existing trails, and resulted in the establishment of a bike trail through the project which completed the Brimfield-Monson-Wales Bike Way. Local and State interests desire that the area continue to be managed to retain its natural appeal and aesthetics, and that the reservoir area remain open for hiking, biking, hunting, and fishing.

MASTER PLAN  
CONANT BROOK DAM, MASSACHUSETTS

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## **1. INTRODUCTION**

### **1.1 Project Authorization and Purpose**

The Conant Brook Dam project was authorized by the Flood Control Act of 1960 (House Document 434, 86th Congress, 2nd Session). The dam and reservoir are located entirely within the town of Monson, Massachusetts.

Authorization for development and use of Corps of Engineers reservoir areas for public recreation and other purposes is contained in Section 4 of the Flood Control Act of December 22, 1944 (Public Law 534, 78th Congress), as amended.

Conant Brook Dam is a single purpose flood control project and is part of the Corps of Engineers comprehensive flood control plan for the Connecticut River Basin. This comprehensive plan consists of sixteen dams and reservoirs, and 24 local protection projects. Two of these flood control dams (Conant Brook and Barre Falls), and four local protection projects (Chicopee Falls, Three Rivers, Ware, and West Warren) are located in the Chicopee River Basin (see Figure 1). Conant Brook Dam reduces flood damages primarily in the town of Monson, and to a lesser extent, in other communities farther downstream along the Quaboag and Chicopee Rivers. The project also provides natural resources management and recreational opportunities that are compatible with the project's primary purpose of flood control.

### **1.2 Purpose and Scope of the Master Plan**

This master plan for management of natural resources and outdoor recreation has been prepared in accordance with the objectives and policies governing planning, development, and management of these resources at Corps of Engineers water resources projects. These objectives and policies are outlined in ER 1130-2-540, "Environmental Stewardship Operations and Maintenance Policies"; ER 1130-2-550, "Recreation Operations and Maintenance Policies"; EP 1130-2-550, "Recreation Operations and Maintenance Guidance and Procedures"; ER 1165-2-400, "Recreational Planning, Development, and Management Policies"; and other related or referenced regulations and policies.

ER 1130-2-540 established the following program objectives for management of a project's natural resources.

- Manage natural resources on Corps of Engineers administered land and water in accordance with ecosystem management principles to insure their continued availability.
- Provide a safe and healthful environment for project visitors.

Utilizing this general guidance, ER 1130-2-550 and EP 1130-2-550 provide the specific policy for preparation of project master plans. Each master plan must cover all resources, including, but not limited to fish and wildlife, vegetation, cultural, aesthetic, interpretive, recreational, mineral, commercial and outgranted lands, easements, and water. Based on EP 1130-2-550, the primary goals of the Conant Brook Dam Master Plan are to prepare a concept document that prescribes an overall land and water management plan, and establishes resource objectives, and associated design and management concepts, which:

- Provide the best combination of responses to regional needs, resource capabilities and suitabilities, and expressed public desires consistent with authorized project purposes;
- Contribute towards providing a high degree of recreational diversity within the region;
- Emphasize the particular qualities, characteristics and potentials of the project;
- Exhibit consistency and compatibility with national objectives and other state and regional goals and programs.

ER 1130-2-550 further defines these goals as they relate to recreation management and established the following program objectives:

- Provide a quality outdoor recreation experience which includes an accessible, safe and healthful environment for a diverse population;
- Increase the level of self sufficiency for the Corps recreation program;
- Provide outdoor recreation opportunities on Corps of Engineers administered land and water on a sustained basis; and
- Optimize the use of leveraged resources to maintain and provide quality public experiences at Corps water resources projects.

### **1.3 Planning Process**

An interdisciplinary study team consisting of staff from the Corps of Engineers, New England District (Engineering/Planning Division and Construction/Operations Division) developed the majority of information contained in the master plan. The team included personnel with expertise in the following disciplines:

- Planning and engineering
- Environmental resources

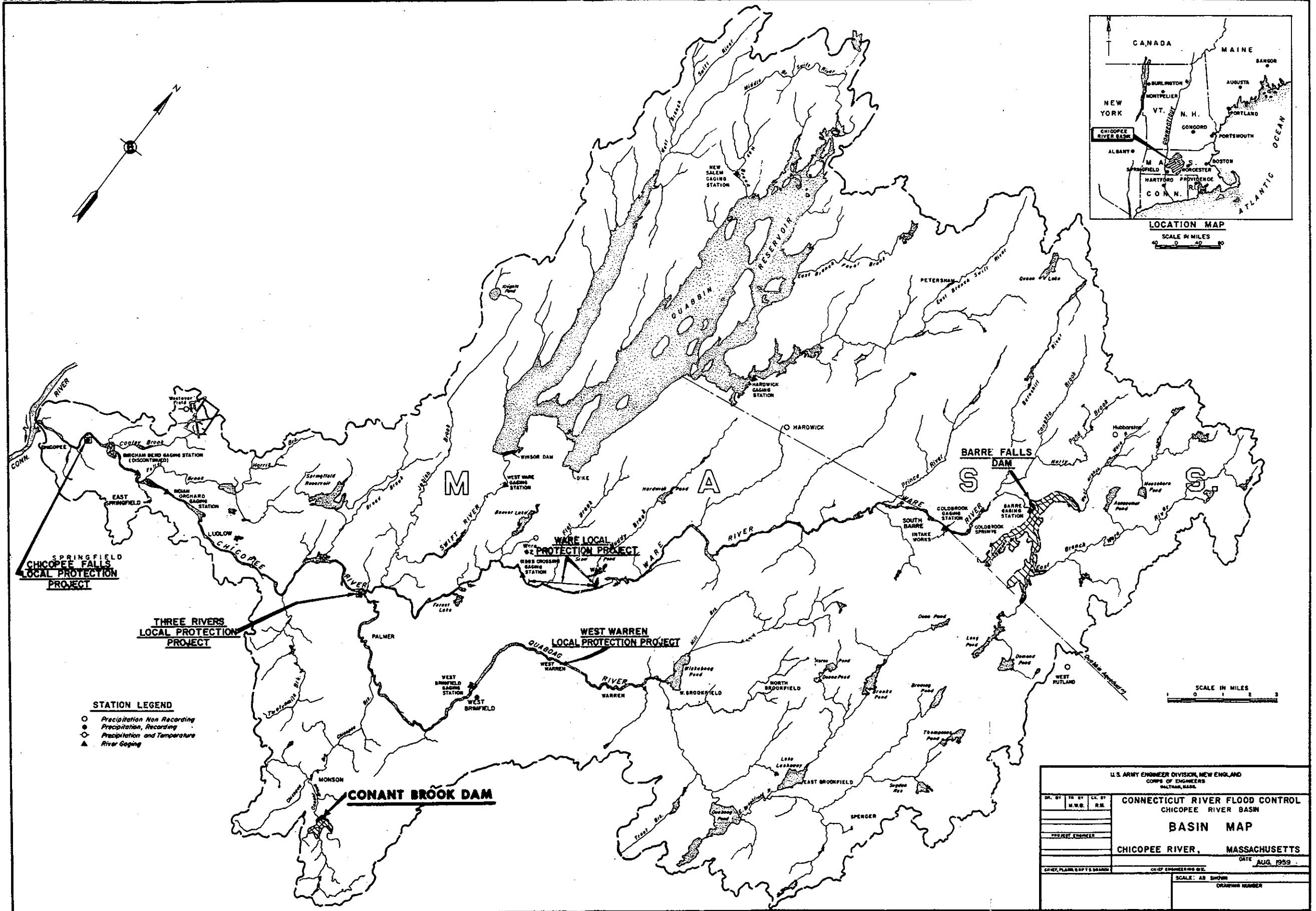


Figure 1



- Landscape architecture
- Archaeological and cultural resources
- Forestry

Major inputs to the planning process included natural, cultural, and recreational resource inventories and analysis; projections of future needs; and public desires for use of project lands. This information was integrated into project-wide, and specific objectives and goals to provide the best use of the 456 acres of Federally-owned land at Conant Brook Dam.

Public input was obtained through public notices; coordination with state, regional and local officials; a public meeting held in Monson, Massachusetts to present preliminary study results and receive input; and public review of the draft Master Plan.

Approval of this Master Plan will rescind the "Master Plan for Recreation Resources Development, Conant Brook Dam, Monson, Massachusetts", dated April 1979.

The Master Plan is a policy document that serves as an overall management guide for the project while specific management actions are included in the Operational Management Plan (OMP). For consistency with the Master Plan, the existing OMP, dated 1993, will be revised to describe, in detail, how the objectives and concepts of the Master Plan will be achieved.

#### **1.4 Reevaluation of the Master Plan**

The Master Plan is a flexible planning document that will be periodically reevaluated to be kept current. It will be reviewed on a periodic basis, and will be revised as required. The District Engineer will approve supplements and revisions to the Master Plan.

#### **1.5 Application of Federal Laws**

The following laws and regulations provide for the development and management of Federal projects:

1. **Historic Sites, Buildings, and Antiquities Act of 1935** (16 U.S.C. 461-467). Known as the Historic Sites Act, this Act declared it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provides for designation, acquisition, administration, and protection of such sites. (Additionally, National Historic Landmarks are designated under authority of this Act.)

2. Public Law 78-534 (**The Flood Control Act of 1944**), as amended by the Flood Control Acts of 1946, 1954, 1960 and 1962, authorizes the Corps of Engineers to construct, operate, and maintain public park and recreation facilities at water resource development projects, and to permit local interests to construct, operate, and maintain such facilities.
3. Public Law 85-624 (**The Fish and Wildlife Coordination Act**) requires that the Corps of Engineers and any agency impounding, diverting, or controlling water, consult with the United States Department of the Interior, Fish and Wildlife Service. The Department of the Interior would evaluate proposed water resources development measures, and determine potential impacts to wildlife resources and measures needed to prevent such impacts.
4. **Reservoir Salvage Act of 1960** (16 U.S.C. 469-469c). This Act is also known as the Archaeological and Historic Data Preservation Act, Archaeological and Historic Preservation Act, "Moss-Bennett Act", and the Archaeological Recovery Act. When enacted in 1960, this law simply authorized the Secretary of the Interior to conduct salvage archaeology in advance of dam and reservoir construction by the Corps of Engineers and other agencies. In 1974, it was amended comprehensively to authorize salvage in connection with all kinds of Federal, Federally assisted, and Federally licensed projects. As amended, it also directs Federal agencies to cooperate with the Department of the Interior in conducting salvage, or to fund such work themselves, and to report to Interior on archaeological programs and any disturbance of archaeological sites.
5. Public Law 86-717 (**Forest Cover Act**, 6 September 1960) provides a statutory mandate for multiple use forest management, or other vegetative cover management, on project lands and waters.
6. Public Law 89-72 (**The Federal Water Project Recreation Act of 1965**), accompanied by House Committee Report No. 254, requires that the Corps of Engineers and other Federal agencies give full consideration to fish and wildlife enhancement. It also provides for non-Federal participation in land acquisition, and in the development and management of recreational facilities and fish and wildlife resources.
7. Public Law 89-665 (**The National Historic Preservation Act of 1966**), as amended in 1992, directs the Corps of Engineers and other Federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation.
8. Public Law 91-190 (**The National Environmental Policy Act of 1969**), directs the Corps of Engineers and other Federal agencies to prepare environmental

impact statements or assessments that describe the environmental effects of proposed projects and measures necessary to minimize any adverse effects.

9. Public Law 91-604 (**The Clean Air Act, as amended**), specifies that any Federal activity, which may result in discharge of air pollutants, comply with Federal, state, interstate, and local requirements concerning control and abatement of air pollution.
10. Public Law 03-205 (**The Endangered Species Act of 1973, as amended**), requires Federal agencies to utilize their authorities to carry out programs for conservation of endangered and threatened species protected by the Act.
11. Executive Order 11988 (**Floodplain Management**, 24 May 1977) requires that the Corps of Engineers and other Federal agencies prevent avoidable adverse or incompatible developments in floodplains by assessing proposed actions, considering alternative approaches when adverse effects would result, and formulating designs and project modifications to minimize impacts.
12. Executive Order 11990 (**Protection of Wetlands**, 24 May 1977) requires that all Federal agencies take action to minimize destruction, loss or degradation of wetlands. It stipulates that Federal agencies must avoid providing assistance for new construction located in wetlands unless no practicable alternatives exist, and the proposed action includes measures to minimize harm to wetlands.
13. Public Law 95-217 (**Clean Water Act of 1977, as amended**). Section 404 imposes requirements with respect to dredge and fill activities in waterways of the United States, including wetlands. Any fill activities in wetlands must comply with Section 404(b)(1), Guidelines for the Specification of Disposal Sites for Dredge or Fill Material. These guidelines allow fill activities for only the least environmentally damaging practicable alternative.
14. Public Law 95-341 (**American Indian Religious Freedom Act of 1978-AIRFA**). This act formalizes a policy whereby Federal agencies will preserve the inherent right of American Indians to express and exercise their traditional religion. These rights include access to sites (which may be on Federal lands), use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. The Act requires agencies to consult with Native American groups, but agencies need not accede to Native American requests.
15. Public Law 96-95 (**Archaeological Resources Protection Act of 1979 - ARPA**). This statute provides protection for archaeological resources by requiring any interested parties to apply for a permit from the controlling Federal agency to excavate, or remove any archaeological resource located on public or Indian

lands. The Act also provides for civil and criminal penalties for individuals disturbing or looting sites (including military personnel that allow such actions).

16. **Public Law 101-601 (Native American Graves Protection and Repatriation Act of 1990 - NAGPRA).** This act requires agencies to inventory and repatriate certain Native American cultural items recovered from Federal property to associated Native American groups. These items include human remains, associated funerary objects, sacred objects, and objects of cultural patrimony. The Act describes in detail the items included in these classifications and the procedure for repatriation. The Act also provides for the inadvertent discovery of Native remains and objects. If discovery is related to an activity on Federal land such as construction, logging, agriculture, or other, such activity must cease until proper notification is conducted.
17. **National Register of Historic Places, Nominations by States and Federal Agencies (36 CFR 60).** These regulations govern the process whereby State and Federal agencies nominate specific resources under their control to the National Register of Historic Places. This is the country's basic inventory of historic resources and it is maintained by the Secretary of the Interior. This inventory includes buildings, structures, objects, sites, districts, and archaeological resources that may be significant at the national, state, or local level.
18. **Advisory Council on Historic Preservation, Protection of Historic Properties (36 CFR 800).** These are the implementing regulations which govern the Section 106 review process established by the National Historic Preservation Act of 1966, as amended for Federal agencies. These regulations implement procedures for assessing the effects of Federally approved, assisted, or funded undertakings on properties which are, or may be eligible for listing on the National Register of Historic Places.

## **1.6 Corps of Engineers Guidance**

The Conant Brook Dam Master Plan has been prepared in accordance with guidance contained in the following Corps regulations, pamphlets, and manual:

ER 1130-2-500	Project Operations, Partners and Support, Work Management Policies
ER 1130-2-540	Environmental Stewardship, Operations and Maintenance Policies

ER 1130-2-550	Recreation, Operations and Maintenance Policies
ER 1165-2-400	Recreation Planning, Development and Management Policies
EP 1130-2-500	Project Operations, Partners and Support, Work Management Guidance and Procedures
EP 1130-2-540	Environmental Stewardship, Operations and Maintenance Guidance and Procedures
EP 1130-2-550	Recreation, Operations and Maintenance Guidance and Procedures
EM 1110-1-400	Recreation Planning and Design Criteria

### 1.7 Prior Pertinent Reports

The following design memoranda, prepared by the New England District, Corps of Engineers, provided basic data concerning the project.

<u>Memorandum No.</u>	<u>Title</u>	<u>Date</u>
1	Hydrology and Hydraulics	March 1963
2	Detailed Design of Structures	November 1963
3	Embankments and Foundations	October 1963
4	Concrete Aggregates	November 1962
5	General	April 1963
6	Site Geology	July 1963
7	Real Estate	November 1963

Other New England District reports that were reviewed and evaluated as part of this master planning effort include the following:

1. "Operation and Maintenance Manual, Conant Brook Dam, Monson, Massachusetts", dated June 1972.

2. "Environmental Assessment of the Operation and Maintenance of Conant Brook Dam , Monson, Massachusetts", dated June 1974.
3. "Cultural Resource Reconnaissance for Operation and Maintenance of Conant Brook Dam, Monson, Massachusetts", prepared by the NED staff archaeologist, John S. Wilson, in 1978.
4. "Master Plan for Recreation Resources Development, Conant Brook Dam, Monson, Massachusetts", dated April 1979.
5. "Forest Management Plan, Master Plan Appendix B, and Fish and Wildlife Management Plan, Master Plan Appendix D, Conant Brook Dam", dated May 1981.
6. "Conant Brook Water Quality Evaluation", dated June 1983
7. "Master Water Control Manual, Connecticut River Basin", dated November 1983
8. "Operational Management Plan, Conant Brook Dam", dated 1993.
9. Five "Periodic Inspection Reports" have also been prepared for Conant Brook Dam. These are dated February 1977, May 1981, October 1985, November 1990, and October 1995.

In addition, the following reports provided information on recreation and archaeological resources in the project area.

- The 1988-92 Massachusetts Statewide Comprehensive Outdoor Recreation Plan, "For Our Common Good", prepared by the Massachusetts Department of Environmental Management.
- "Soil Survey of Hampden and Hampshire Counties, Massachusetts, Eastern Part", prepared by the U.S.D.A. Soil Conservation Service (currently the Natural Resources Conservation Service), issued in April 1989.

## **2. PROJECT DESCRIPTION**

### **2.1 Location**

Conant Brook Dam is located on Conant Brook, a tributary of Chicopee Brook which flows to the Quaboag River. The Quaboag River is a major tributary of the Chicopee River. The project is situated entirely within the town of Monson, which is in Hampden County in south central Massachusetts. The dam is about 1-1/2 miles southeast of the center of town. The location of the dam and its reservoir area are shown on Plate 1.

Land use adjacent to the project area is predominantly rural, with a mix of residential development and undeveloped land. There is little industrial development in Monson, and only two percent of the town is zoned for commercial development.

### **2.2 Project Data**

Conant Brook Dam is a rolled earthfill dam with an impervious core and rock slope protection. The dam has a top elevation of 771 feet National Geodetic Vertical Datum (NGVD), an overall length of 1,050 feet, and a maximum height of 85 feet. An emergency chute type spillway with a 100 foot wide ogee concrete weir is located at the right abutment of the dam. The spillway has a crest elevation of 757 feet NGVD, 14 feet below the crest of the dam. The outlet works at the dam consist of an ungated 36-inch diameter concrete conduit about 405 feet long. The inlet structure and 10 foot wide inlet channel have an invert elevation of 694 feet NGVD. A trash rack and log boom protect the inlet structure from being clogged by debris. The project also includes a 900 foot long dike at the northern end of the reservoir. This dike raised a natural drainage divide a maximum of 20 feet (to elevation 771 feet NGVD), and serves as a foundation for Munn Road, which was relocated to the top of the dike.

At spillway crest elevation, Conant Brook Reservoir would have a surface area of 158 acres and a storage capacity of 3,740 acre-feet. This is equivalent to 9 inches of runoff from the contributing drainage area of 7.8 square miles. The project was completed in 1966 at a total cost of \$2,950,530.

Conant Brook Dam is self-operating. With an ungated outlet, the reservoir acts as an automatic detention basin that stores all flows exceeding the capacity of the conduit. The selected conduit size permits passage of normal brook flows without utilizing any appreciable storage in the reservoir.

## 2.3 Real Estate and Land Use

All lands at Conant Brook Dam were acquired for flood control operations at the project. This included areas for permanent structures, construction, borrow, roadway relocation, and the reservoir. At the present time, about 456 acres are owned in fee and easements are maintained over an additional 2 acres. The 2 acres in easement are for slopes along Wales Road. Since land at the project was purchased for flood control and the primary use continues to be for flood control, all lands at the project are allocated to the operations category.

At the present time there are two outgrants of Corps property; one long-term and one short-term. The long-term outgrant involves a 25-year easement for an underground gas line, and the short-term (5-year) outgrant concerns use of project lands for agricultural purposes. General information concerning these outgrants is shown in the following list:

<u>Lessee</u>	<u>Purpose(Use)</u>	<u>Area</u>
Tennessee Gas & Pipeline Co.	Gas Transmission Line	4.3 acres
Norman T. McMahon	Agricultural	8.0 acres

## 2.4 Reservoir Management

Reservoir management has proceeded in accordance with the basic document; "Master Plan for Recreation Resources Development", dated April 1979. The overall project is maintained by the New England District, Corps of Engineers.

Conant Brook is managed by a Project Manager and two Rangers that are stationed at East Brimfield Lake. They perform continual operation and maintenance, and lease administration for East Brimfield Lake, Westville Lake, and Conant Brook Dam. Because Conant Brook Dam is self-regulating, no permanent onsite personnel are required. In addition to their primary flood control duties, project staff are also responsible for implementation of the Master Plan through the Operational Management Plan, visitor assistance, interpretive services, recreation, and natural resource management.

## 2.5 Relationship of the Project to Other Projects and Programs

As stated in Section 1, the project's primary purpose is to provide flood protection to the downstream community of Monson, Massachusetts. The project is also an element in the Corps of Engineers comprehensive flood control plan for the Connecticut River Basin, and although the project's flood control capability is limited (only controlling runoff from 7.8 square miles), it helps reduce flood damages at other downstream locations. During flood periods, the Reservoir Control Center (RCC) at New England District Headquarters in Concord, Massachusetts, coordinates the operation of the 16 dams and reservoirs in the



system. Although Conant Brook Dam is self-regulating, water levels and rainfall are electronically monitored by the RCC during flood events. In addition to showing conditions at the dam, this information is used in conjunction with other rainfall and runoff data in the Connecticut River basin to achieve the maximum reduction in flood stages and damages.

## **2.6 Significant Flood Control Storages**

Conant Brook Dam is a dry bed reservoir with a single 36-inch diameter discharge conduit. A pool stage of 15.0 feet above the invert of this conduit represents the start of significant storage. Flood waters stored at this level utilize approximately 5 percent of the 3,740 acre-feet of total flood control storage available at spillway crest elevation 757.0 feet NGVD (stage of 64 feet). Since being placed in operation in 1960, the pool stage has been at 15.0 feet or higher on 17 occasions, with the ten highest recorded pool levels as follows:

<u>Date</u>	<u>Pool Stage (feet)</u>	<u>Percent of Storage Utilized</u>
June 1984	27.0	17
June 1982	24.5	14
March 1979	20.0	9
March 1993	19.8	9
February 1970	18.0	7
January 1976	17.8	7
April 1987	17.7	7
March 1968	17.6	7
April 1996	17.6	7
April 1983	17.5	7

The remaining significant storage events used from 5 to 7 percent of available flood storage, and resulted in pool stages that ranged from 15.0 to 17.2 feet.

## **2.7 History**

### **2.7.1 Prehistoric Period**

Recorded prehistoric sites are primarily located on large ponds and terraces of major tributaries within the Quaboag River drainage. However, the greater potential for modern disturbance of these areas by plowing or construction may have biased recording towards such areas, as artifacts would be most likely to be uncovered by such activities.

At the time of European contact, there were fortified villages at Sherman Pond in Brimfield, and on the Ware River in New Braintree, and the Quaboag River in Brookfield. The Bay Path, a route used by both Native and English travellers, ran east to west along the Quaboag River.

The Conant Brook area may have served as a hinterland throughout the prehistoric period, where fall and winter camps for hunting, trapping, wildfowl netting, and the gathering of edible plants might be expected, while the river terrace sites could have provided spring fishing stations and suitable agricultural plots during late prehistoric times.

### **2.7.2 Historic Period**

Settlements in what is now Government property at Conant Brook Dam began in the second decade of the eighteenth century and consisted of farms and small scale industries. Many of the farms were abandoned a century later and considerable property passed to town ownership. In 1894, the town purchased a large part of the present project area for water supply purposes, and constructed a circular water collection well of stones, 72 feet in diameter by 23 feet in depth. Pipe was laid from this well to Monson Center and the well was covered by a conical iron roof. A rectangular stone well, 60 feet by 35 feet by 25 feet was dug in 1924 to augment this system. The old Conant Mill Dam was raised in 1894 for emergency water supply and a pair of circular well troughs were built beside Wales Road during this period. Between the 1920s and 1963 there were few changes evident in the landscape except for the construction of a summer cottage on Wales Road. The wells were filled in during construction of the dam in 1964-66.

## **2.8 Climate**

The Chicopee River Basin, which encompasses the Conant Brook drainage area, has a variable climate characterized by frequent but short periods of heavy precipitation. The basin lies in the path of the "prevailing westerlies" and cyclonic disturbances that cross the country from west to east or southwest to northeast. These types of storms occur at fairly regular intervals. The area also experiences two types of coastal storms; tropical hurricanes and non-tropical storms. Hurricanes normally occur in August and September and can cause significant damage and flooding. Non-tropical coastal storms develop along the east coast usually in the fall through spring months, and may contain large amounts of precipitation. Thunderstorms also occur during the summer months, and are normally of short but intense duration.

The average annual precipitation over the Chicopee River Basin is about 44 inches, ranging from less than 40 inches in the Chicopee area to more than 50 inches at the headwaters of the Ware River in the northeast portion of the basin. On the average, precipitation is distributed fairly uniformly throughout the year. Annual snowfall in the basin is approximately 50 inches, with greater depths at higher elevations.

The mean annual temperature of the basin is about 50 degrees Fahrenheit (F.). Average monthly temperatures range from highs of 68-72 degrees F. in July and August to 25-27 degrees F. in January and February. Occasional extremes in temperature range from the

upper 90's to lows of minus ten or lower. Freezing temperatures can be experienced from the latter part of September to the early part of May.

## **2.9 Topography**

The Conant Brook project is located within the western part of the Worcester plateau, a region of moderate relief. Elevations in the area range from about 700 feet NGVD at the dam site to a maximum of about 1260 feet NGVD in the headwaters of Conant Brook. The topography in the project area is characterized by broad, steep-sided hills and poorly drained valleys. The land surface is controlled largely by the underlying folded and very much altered crystalline bedrock that has been modified by glacial and post glacial erosion and deposition.

The project area is generally hilly with elevations ranging from 700 to 900 feet NGVD. The relatively steep slopes of the drainage area and poorly drained narrow valleys are conducive to rapid runoff. This results in quick inundation of the lower levels of the project during heavy rain or snowmelt.

Remnants of glacial outwash and lake deposits are present on the floor and sides of the main valleys. Above these deposits, the slopes are blanketed with glacial till through which bedrock outcrops rather extensively at the higher elevations. There is also limited bedrock exposure along the valley floors due to erosion of overburden material.

## **2.10 Project Access**

Access to the project area is provided from Wales Road which follows a generally southeasterly direction from State Route 32 in south Monson. From Wales Road, the access road provides entrance to the damsite and parking area, and Munn Road provides access to the dike area. As shown on Plate 2, State Route 32 can be reached from Interstate 90 (Mass Pike) or State Route 20.

### **3. RESOURCE INVENTORIES AND ANALYSIS**

#### **3.1 Introduction**

The Conant Brook Dam project area provides important natural resources and recreational opportunities for the surrounding area, as well as protection for the valuable natural resources in the project area. Management programs are carried out on project lands for fish and wildlife, and forestry resources. Recreational activities include hiking, biking, fishing, hunting, sightseeing, horseback riding, cross-country skiing, and snowmobiling.

#### **3.2 Natural Resources**

##### **3.2.1 Geology and Soils**

During the late stages of the glacial period, the Worcester Plateau was altered by intermittent cycles of erosion and deposition from an irregularly oscillating ice margin. This action left glacial till, boulders, kettles, and other features after the glacial retreat. Bedrock in the project area consists of altered granitiferous mica schist with stringers and veins of quartz and feldspar. This bedrock generally runs in a north-south direction leaving two valleys between the hills. The first is Vinica Brook which enters the project from the southeast, and the second is a smaller brook which originates in the wetland just below the dike in the northern part of the project.

Soils within the project area have been identified by the U.S.D.A. Soil Conservation Service (currently the Natural Resources Conservation Service) and are presented in their report entitled "Soil Survey of Hampden and Hampshire Counties, Massachusetts, Eastern Part", issued in April 1989. The General Soil Map in this report places Conant Brook within an area of Scituate-Montauk-Charlton soils. These soils are "very deep, nearly level to very steep, well drained and moderately well drained soils formed in loamy and sandy glacial till; on uplands".

Although the project is located within the Scituate-Montauk-Charlton general soil classification, a large percentage of soils within the project area fall within the Hinckley classification, and the large wetland area south of the Munn Road dike consists of Freetown muck. Hinckley soils are droughty loamy sands that are underlain by stratified sand and gravel at depths of less than 18 inches. Freetown muck is nearly level, very deep, and poorly drained.

Appendix C contains detailed information on soil types and suitabilities at the project. Major soil types are described and a soil map (Figure C-1) shows the soil types in the project area. Data concerning the suitability of soils for recreational development and roadways is shown on Table C-1. In general, steep slopes and a large area of Freetown muck, limit recreational and other development at the project. Soil erosion is a recurring problem along the gas line right-of-way, and the trail between the end of East Hill Road and the Munn Road

dike. Illegal use of off road vehicles has contributed to erosion in these areas. Efforts to stabilize the soil, and enforce the ban on off road vehicles will be used to minimize erosion in these areas.

### **3.2.2 Surface Waters and Wetlands**

Water resources in the project area include Conant Brook, Vinica Brook (the principal tributary of Conant Brook), Squire Pond, Duck Pond, the dam impoundment, the Monson Reservoir downstream of the dam, and several unnamed tributaries. (See Plate 1).

Conant Brook is a tributary of Chicopee Brook, which is in the Chicopee River watershed within the Connecticut River Basin. Chicopee Brook runs north to its junction with the Quaboag River, which runs northwesterly until it joins the Ware River and forms the Chicopee River. The Chicopee River is a major tributary of the Connecticut River.

Vinica Brook flows into the project area from the southeast through a culvert under Wales Road into a steep sided ravine. Squire Pond is located in the southeast corner of the project area, covers approximately 7 acres (two thirds of which is on government owned property), and is approximately 4-5 feet deep. The impoundment behind the dam is a shallow pool, approximately 2-3 feet deep, and approximately 2-3 acres in size. Duck Pond is located adjacent to the eastern boundary of the property, and is approximately 4 feet deep.

The 1996 Massachusetts Water Quality Standards do not specifically rate Conant Brook and its tributaries. Since Conant Brook flows into Chicopee Brook, which is rated as a Class B cold water fishery, the Massachusetts Division of Water Pollution Control has assumed a similar designation for Conant Brook (Draft EA, 1997). Class B waters are designated as a habitat for fish and other aquatic life, and for primary and secondary contact recreation. They are suitable as a source of public water supply with appropriate treatment, irrigation and other agricultural uses, and for industrial cooling and process uses. The waters also have consistently good aesthetic value.

The ground water at Conant Brook is designated as Class I by the 1996 Massachusetts Water Quality Standards (Draft EA, 1997). This classification includes fresh ground waters found in the saturated zone of unconsolidated deposits, or consolidated rock and bedrock, and are designated as a source of potable water supply. Although surface waters and groundwaters are designated under the state classification to be suitable as a source of potable water supply, Conant Brook is not used as a source of water supply.

The Corps of Engineers conducted water quality monitoring of the Conant Brook project area from 1970 to 1983. Water quality parameters evaluated included dissolved oxygen, pH, temperature, turbidity, color, total coliform, iron, nitrate, and sulfate. The results of the monitoring showed that the waters of the project area are of generally good quality, but do not fully meet the requirements of their Class B designation. Areas of concern were high coliform counts, low pH, and high metals.

At present, no aquatic weed problems exist at Conant Brook. The presence of aquatic weeds is evident, however, at Squire Pond. Plant management to control any problem conditions can include chemical, biological and mechanical techniques to provide for the most suitable and stable conditions. Should aquatic weed problems occur, the reasons for their establishment, such as nutrient enrichment or siltation, should be identified.

Currently, erosion and subsequent sedimentation of streams and wetlands is caused by the unauthorized and irresponsible use of all-terrain vehicles and dirt bikes. A law enforcement contract with the town of Monson in effect to control unauthorized use of these vehicles. This contract should reduce this use, and help rehabilitate the severely eroded areas.

Adverse erosion effects on the shoreline from flood impoundment operations are not a significant problem in the reservoir due to the short period of time that flood waters are present.

Erosion control practices will be implemented during forest management practices to control the release of sediments into any surrounding water bodies. Practices would include the provision of filter strips, water bars and control of equipment on steep slopes.

Many wetland areas are located within the Conant Brook dam project. Wetlands provide many important functions and values. They store flood waters, and by filtering and removing pollutants, improve water quality. Wetlands also serve as groundwater recharge areas. Wetland areas directly associated with the brook can provide important nursery areas for fish. The wetlands are also important habitat areas for birds, reptiles, amphibians, and many species of mammals. Recreational opportunities for birdwatching and fishing are also provided, along with providing high aesthetic value.

Delineation of wetlands at the Conant Brook project was carried out using stereoscopic interpretation of 1992 aerial photographs, and ground verification in 1996. The wetlands were delineated and classified according to the Cowardin et al. classification system. The wetland systems identified include approximately 68 acres of palustrine wetlands, approximately 3.2 acres of aquatic bed, emergent persistent and emergent nonpersistent, and 2.7 miles of open water within a channel and intermittent stream.

Several areas were identified as probable vernal pools. These include a depression about 100 feet in diameter situated east of the Munn Road parking area, and a depression approximately 75 feet by 100 feet situated about 20 feet east of the middle hiking trail. The first area consists of a scrub/shrub (alder) interior surrounded by a red maple dominated wetland. The other area is also dominated by red maple, and the bottom of the pool was covered by larval amphibians during a 1996 field inspection. Isolated wetlands about 100 feet south of the former East Hill Road and adjacent to the former Stanton Road, were also identified as possible vernal pools.

The acreage of each wetland category is shown in Table 1. Plate 3 is a wetland map illustrating the various wetland categories delineated in the project area. A description of the wetland areas is provided in Appendix B, "Wetland Community Description, Conant Brook Project, 1996, by Peter Trincherro, Corps of Engineers". The description of the wetland areas divided the project into three areas:

- (1) Wetland communities in the northern portion of the project area, outlined by East Hill, Munn, and Stanton Roads;
- (2) Wetland communities in the southeastern portion of the project area which includes drainage from Squire Pond and Vinica Brook; and,
- (3) Wetland communities adjacent to the dam where the drainage from the first two areas flow into the basin and the discharge area just below the dam.

**TABLE 1**  
**Wetland Acreage for Conant Brook Dam**

**PALUSTRINE SYSTEM**

Open Water, less than 20 acres	0.8 acres
Aquatic Bed Vegetation, rooted vascular	5.1 acres
Aquatic Bed Vegetation, floating vascular	16.8 acres
Emergent Vegetation, persistent	10.1 acres
Emergent Vegetation, nonpersistent	2.4 acres
Moss Wetland	0.5 acres
Shrub-Scrub Broad-Leaved Deciduous	15.4 acres
Forested Broad-Leaved Deciduous	13.4 acres
Forested Needle-Leaved Evergreen	<u>1.6 acres</u>
<b>TOTAL</b>	<b>66.1 acres</b>

**RIVERINE SYSTEM**

Open Water Contained Within A Channel (miles)	1.5 miles
Aquatic Bed Vegetation, rooted vascular	0.5 acres
Emergent Vegetation, persistent	1.6 acres
Emergent, nonpersistent	1.1 acres
Intermittent Stream (miles)	1.2 miles
<b>TOTAL (Aquatic Bed/Emergent)</b>	<b>3.2 acres</b>
<b>TOTAL (Open Water-channel/Intermittent)</b>	<b>2.7 miles</b>

The extensive areas of wetlands and numerous wetland types have formed the basis for and are compatible with current development and uses of project lands. Analysis of these resources, however, indicate that the protected state species, the Golden Club, at Duck Pond, requires continued and expanded protection. Duck Pond has the largest colony of Golden Club in Massachusetts, and may provide the best conditions for colony growth

A buffer zone of 100 feet at elevation 775 NGVD is currently in place to provide protection of the Duck Pond habitat, and, in most cases, the zone extends beyond 100 feet. This zone complies with and exceeds the state requirements of 100 foot buffer zones for wetland protection.

### **3.2.3 Vegetative Cover**

#### **3.2.3.1 Forest Lands**

Conant Brook is located in the southeastern part of the Northern Forest Region just above the Central Hardwood Forest Region. The project has characteristics from each region. The forest is therefore a complex mixture of both cone bearing and deciduous, broad-leaved trees. Approximately 71 percent (335 acres) of the project area is forested. Typical forest species found in the project area include white oak (*Quercus alba*), red oak (*Q. rubra*), black oak (*Q. velutina*) with smaller numbers of red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), black cherry (*Prunus serotina*), eastern hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*). Blueberry, viburnum, and various herbaceous species make up the under story. A discussion of forest species associated with wetland habitats is included in the "Surface Waters and Wetlands" Section.

A forest inventory was completed in 1994 which divided the project into 18 forest stands (See Plate 4). The forest types found within these stands and acreages are also shown in Plate 4. Table 2 shows the acreages of the nine cover types found at Conant Brook. The predominant size class is small saw timber (11.0 - 13.9 inches in diameter) and stands are generally in the 60 - 80 year class with 100 percent crown closure. (Draft Environmental Assessment, Operation and Maintenance, Conant Brook Lake, New England District, Corps of Engineers, 1997). Artificial reforestation was conducted in the 1980's with conifers and shrubs to supplement natural regeneration in two borrow areas.

The quality of the forest stands is fair to medium. The low stand quality and productivity is due to soil limitations and vegetative competition. There is a need to increase harvesting and to implement timber stand improvement practices to improve the overall quality, productivity, and diversity of the forest stands. Efforts for the production of high quality saw timber should be concentrated on those areas having soils with the best potential for productivity. Silvicultural practices will also benefit wildlife habitat by providing a variety of age classes of trees which will provide food and shelter. However, the oldest sections of forest should be maintained for biodiversity and aesthetics. As red pine is harvested or dies, natural regeneration should occur to enhance forest diversity. There is also



a need to increase the amount of mast trees for acorn dependent wildlife species. Improvement of the wildlife habitat would improve consumptive and non-consumptive recreational uses. Weeding, thinning, and pruning will also improve the overall aesthetics of the forest, while providing scenic views and diversity for passive recreational users.

**TABLE 2**

**Acreages of Forest Cover Types - Conant Brook Project Area**

<u>Cover Type</u>	<u>Acreage</u>
White Pine/Hemlock	73
Mixed Oak	53
Hemlock/Hardwoods	38
White Pine/Hardwoods	37
Gray birch/Red Maple	33
Oak Hardwoods	31
Northern Red Oak	28
White Pine/Oak	23
Red Pine/White Pine	<u>16</u>
<u>TOTAL</u>	332

Shrubs commonly found in the under story include high bush blueberry (*Vaccinium corymbosum*), low bush blueberry (*Vaccinium angustifolium*), mountain laurel (*Kalmia latifolia*), and maple-leaved viburnum (*Viburnum acerifolium*). Herbaceous species found include false Solomon's-seal (*Smilacina racemosa*), trillium (*Trillium sp.*), trout-lily (*Erythronium americanum*), Jack-in-the-pulpit (*Arisaema triphyllum*), wild sarsaparilla (*Aralia nudicaulis*), groundnut (*Apios americana*) and purple avens (*Geum rivale*).

**3.2.3.2 Open Lands (Grass and Old Fields)**

Open areas make up approximately 34 acres or 7 percent of the reservoir (OMP, 1993). The open space areas consist of a total of 10 acres of grass mowed monthly. The remaining 24 acres includes areas occupied by the dam and dike, paved roads and open water. An 8 acre parcel south of Squire Pond is currently leased out for agricultural purposes. The land is used for production of hay.

Old fields provide much needed habitat diversity, supports wildlife both on the project lands and in the region, and should be maintained as open land. The need to provide early successional vegetation, while not fragmenting older forest, should be considered. There is a regional shortage of open grass land wildlife needs as many potential open space areas are being lost to woody growth. This needed additional open space can be acquired through

the continuance of, as well as through new agricultural leases. New openings for edge species should occur near existing openings to minimize impacts on large tracts of forest. As it is expensive to artificially open these areas, cultivation is the most economically feasible method to maintain and improve these important areas. Abandoned fields can be opened through mechanical brush removal and controlled burning. Travel lanes for wildlife can be provided through hedgerows of native plant species which also intersperse cover and food plots. A small percentage of crops is required to remain for the benefit of wildlife. Any fields formerly cleared for agriculture can be used for the cultivation of hay and other crops. This usage will prevent the fields from becoming fallow, control nuisance growth, and enhance wildlife habitat.

#### **3.2.3.3 Developed Areas**

Developed areas at the Conant Brook Dam project include the structural components of the dam and dike. There are no developed recreational facilities at the project. A small parking area is located at an overlook near the dam, and there is a small trail head parking area off of Munn Road. Other developed land consists of about 4.7 miles of trails, and approximately 1.7 miles of old gravel roads that are maintained within the reservoir area.

#### **3.2.3.4 Exemplary Natural Communities**

The large population of Golden Club at Duck Pond is the largest Golden Club stand in Massachusetts. It is a palustrine emergent species found in silty, muddy or peaty substrate in the shallow water of ponds, bogs, and slow rivers. In cooperation with the Massachusetts Natural Heritage Program, the Corps has designated Duck Pond and its perimeter as "A Natural Area" to protect the plant and its habitat.

Specific protection requirements for Golden Club include maintaining a minimum 100 foot buffer zone around Duck Pond, an isolated wetland. This correlates with the Commonwealth of Massachusetts' buffer zone requirements for wetland areas. Public access to this area will also be limited.

#### **3.2.4 Wildlife**

The variety of forest types, wetlands, open lands, and riparian habitat present at the project, along with its undisturbed nature, provides for the presence of a large variety of wildlife species.

Mammal species indigenous to the project area include white tailed deer (*Odocoileus virginianus*), eastern cottontail rabbit (*Sylvilagus floridanus mallurus*), skunk (*Mephitis mephitis*), woodchuck (*Marmota monax*), porcupine (*Erethizon dorsatum*), red fox (*Vulpes vulpes*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), and grey squirrel (*Sciurus carolinensis*).

A breeding bird inventory was conducted by the Corps of Engineers in the spring of 1996 to provide a sample of the bird communities found at the Conant Brook project area. Sixty-nine species of birds were noted on the property during the survey. Some of the species noted which were typical of those found in the various habitats included: mallard, black duck, wood duck, great blue heron, wild turkey, ruffed grouse, woodcock, red-winged blackbird, warblers, pileated woodpecker, barred owl, downy woodpecker, black-capped chickadee, and wood thrush. Two "pest" species observed on the property included the brown-headed cowbird and the European starling.

The project area is stocked annually by the Massachusetts Division of Fisheries and Wildlife. About 25 ring-necked pheasants are released each week from the middle of October through the end of November.

Field surveys for herptile species were also conducted by the Corps of Engineers during 1996. Common species included the American toad, green frog, wood frog, pickerel frog, tree frog, spring peeper, spotted salamander, two-lined salamander, snapping turtle and painted turtle. Two common species of freshwater mussels were identified at the project, the Eastern Elliptio (*Elliptio complanata*), and Eastern Floater (*Pyganodon cataracta*).

An invertebrate inventory during the same time period noted 163 species of moths and 33 species of Odonates (21 species of dragonflies and 12 of damselflies).

The forest management activities are directed toward maintaining and improving wildlife habitat. A variety of age classes should be maintained to provide for a continuous supply of food and shelter for wildlife. Management activities include providing for mixed stands of softwoods and hardwoods, provision of slash to provide browsing habitat for deer, retain den and mast trees, and increasing woodland - field edges.

There is a need to provide for open areas to remain in primary succession stage of growth to maintain a variety of interspersed habitats for wildlife. As it is expensive to artificially open these areas, cultivation is the most economically feasible method to maintain and improve these important areas. These open areas contribute to the project's aesthetics, wildlife habitat, and overall environmental quality. Abandoned fields can be opened through mechanical and chemical brush removal and controlled burning. Travel lanes for wildlife can be provided through hedgerows of native plant species which also intersperse cover and food plots. A small percentage of crops is required to remain for the benefit of wildlife. Any fields formerly cleared for agriculture can be used for the cultivation of hay and other crops. This usage will prevent the fields from becoming fallow, controls nuisance growth, and enhances wildlife habitat. Open fields that are to be used for grassland bird habitat should not be mowed until after the nesting season, about July 15.

There is presently an agricultural lease on 8 acres of land in the southeast corner of the project. This area has historically been used to harvest hay. The intent of the lease is to keep this area as open land to prevent it from reverting back to woodland.

### 3.2.5 Fish

The Conant Brook project area contains both cold and warm water fisheries. The hemlock-lined stream banks of Conant Brook provide shade and cooler water temperatures. The Massachusetts Division of Fisheries and Wildlife (MDFW) surveyed Conant Brook in 1972 and 1984. The 1972 survey found the following species: black nose dace, brook trout, white sucker, tessellated darter, chain pickerel, and rainbow trout. In 1984, the survey located brown trout, white sucker, and American eel. The MDFW characterized the stream as a marginal, poorly buffered, trout stream of low productivity. The MDFW put and take trout stocking program will continue as the primary means of fisheries management for Conant Brook.

The small, shallow sub-impoundment behind the dam contains a very limited warmwater fish population. There is no active fisheries management for this area, which only supports limited angling for younger people in the area. Improvement of the fisheries by increasing the water level is not considered feasible because of the effect on flood control operations.

Squire Pond is a 7 acre warmwater pond which most likely supports typical warmwater fish species. However, no fishery surveys have been completed for the pond.

The Conant Brook project is a self-operating dam where outflows equal inflows up to 225 cfs, and flows exceeding this amount are automatically impounded. An erosion control plan is in place should erosion problems occur as a result of flood control operations.

### 3.2.6 Rare, Threatened and Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) inventoried the Conant Brook Dam property in 1996 for moths, butterflies, dragonflies, freshwater mussels, reptiles, amphibians, birds, small mammals, vascular plants, and exemplary plant communities ("Conant Brook Dam Property, Rare or Protected Species and Exemplary Natural Communities Survey", MA-NHESP, 1996). No state or federally listed species of moths, butterflies, freshwater mussels, amphibians, birds, or small mammals were found at Conant Brook. However, the following state listed species of turtle, dragonfly, and plant were found:

<u>Common Name</u>	<u>Scientific Name</u>	<u>State ranking</u>
Spotted Turtle	<i>Clemmys guttata</i>	Special Concern
Comet Darner	<i>Anax longipes</i>	Special Concern
Spring Blue Darner	<i>Aeshna mutata</i>	Endangered
Golden Club	<i>Orontium aquaticum</i>	Threatened
Slender Blue-eyed Grass	<i>Sisyrinchium mucronatum</i>	Threatened

Duck Pond supports important populations of the two species of darners (dragonflies), and the wetland south of Munn Road supports the Spring Blue Darner. One spotted turtle was trapped in the beaver impoundment south of the Munn Road area. Duck Pond also supports a large population of Golden Club.

### **3.2.7 Water Quality**

The 1996 Massachusetts Water Quality Standards do not specifically rate Conant Brook and its tributaries. As Conant Brook flows into Chicopee Brook, which is rated as a Class B cold water fishery, the Massachusetts Division of Water Pollution Control has assumed a similar designation for Conant Brook (Draft EA, 1997). Class B waters are designated as a habitat for fish, other aquatic life, and for primary and secondary contact recreation. Where designated, they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. The waters shall have consistently good aesthetic value.

The ground water at Conant Brook is designated as Class I by the 1996 Massachusetts Water Quality Standards (Draft EA, 1997). This classification includes fresh ground waters found in the saturated zone of unconsolidated deposits or consolidated rock and bedrock and are designated as a source of potable water supply.

The Corps of Engineers conducted water quality monitoring of the Conant Brook project area from 1970 to 1983. Water quality parameters evaluated included dissolved oxygen, pH, temperature, turbidity, color, total coliform, iron, nitrate, and sulfate. The results of the monitoring showed that the waters of the project area are of generally good quality but do not fully meet the requirements of their Class B designation. Areas of concern were high coliform counts, low pH, and high metals.

## **3.3 Archaeological Resources**

A Cultural Resource Reconnaissance survey of the Conant Brook Dam project area was completed in the summer of 1978 as part of our responsibilities under Section 110 of the National Historic Preservation Act of 1966, as amended, for properties owned and operated by NED. This survey consisted of background research and subsurface investigations of the project area (approximately 456 acres) to determine the existence or potential existence of historic and/or archaeological resources. The majority of this narrative has been culled from the 1978 "Cultural Resource Reconnaissance for Operation and Maintenance of Conant Brook Dam, Monson, Massachusetts".

Major impacts upon cultural resources occurred during the construction of the Conant Brook Dam between 1963 and 1966. All standing structures within Government property and adjacent easements were demolished. Construction of the dam and the Munn Road dike,

together with road relocation, most likely destroyed any subsurface features which may have been present in these areas.

### **3.3.1 Prehistoric Resources**

The results of the survey indicated that no prehistoric resources were present within project bounds. Testing strategies were based upon an examination of USGS and Soil Conservation Service maps together with a visual and surface inspection of the entire project. This testing revealed no prehistoric resources within the most probable areas for utilization. However, the potential for prehistoric archaeological sites on small, level areas overlooking the brooks or streams remains moderate due to the existence of numerous sites along the main stem of the Quaboag drainage and for suitable loci throughout the project which may have been utilized for small camps.

The lack of identified prehistoric remains can be explained by a general lack of suitable subsistence resources within the valley, limited areas of low slopes, and evidence of intermittent flooding on level areas of the valley. Furthermore, the extensive disturbance of areas near the brooks during construction of the Monson waterworks and Conant Brook Dam would have destroyed any resources which may have been present in these areas.

The sensitive areas at Conant Brook Dam probably comprise a maximum of 50 acres. These areas contain favorable environmental attributes as well as well-drained sandy soils, close to freshwater (Vinica Brook, Conant Brook, an unnamed stream, Duck Pond, and Squire Pond), fairly flat terrain, (0-8 percent slopes), and little or no previous ground disturbance from project or historic activities.

Possible impacts from project operations would be limited to those resulting from mechanical and chemical effects of flood pool fluctuations. Mechanical effects would include the erosion of small areas due to currents, wave actions, ice scouring, or slumping of saturated soils. Chemical action could include alteration of the soil pH and phosphate, and potential related effects upon cultural materials such as wood, metal, and bone.

As of the date of the reconnaissance survey (1978), flood control operations did not appear to have resulted in appreciable erosion or slumping of soil. Sufficient brush and vegetation existed for anchoring of the soil. Some silt deposition near the brook was most probably the result of intermittent natural flooding of the brooks. An apparent elevation of the water table in areas near the dam was noted, likely as a result of dam construction. This could affect cultural resources, if any were to be found within the area.

Impacts to cultural resources from recreational development have been minimal at most. Passive recreation such as fishing, hiking, and hunting should have no effect upon significant resources. The cultural resources checklist in the Operational Management Plan lists development activities that would need to be reviewed by NED archaeologists on a case-

by-case basis for potential effects upon cultural resources. These activities include construction of trails, access roads, parking areas or similar facilities.

### **3.3.2 Historic Resources**

Background research for the study identified a total of 8 historic period archaeological resources within the project area. Field checking of these sites indicated that 4 of these had been totally obliterated during dam construction, while the remaining 4 were partially destroyed. The nature and condition of these resources indicates that none appear to exhibit characteristics which would qualify them for listing to the National Register of Historic Places and that present reservoir operations would not significantly affect any remaining elements of these sites. These sites are more fully described in the archaeological reconnaissance survey report prepared for the Conant Brook project area by NED.

No further study or evaluation is recommended for these sites and present reservoir operation is not expected to impact features that are remaining. The two farmstead sites are located above the record flood pool and inundation if it occurs, would be rare and of short duration. Avoidance of the two farmstead sites to maintain their present low visibility to visitors should be maintained. Although the two well sites are below past flood pool depths, there is no evidence of damage from flooding to these structures. These wells were filled at the time of project construction, which should preserve their structural integrity and prevent any collapse of the walls.

### **3.4 Recreation Resources**

Although there are no formal, developed recreation areas at Conant Brook Dam and Reservoir, the project provides several opportunities for recreational pursuits. There is a 15 car parking lot at the end of the access road at the west abutment of the dam. This elevated site provides a scenic vista of the dam and small impoundment area, and access to numerous trails within the project area. There are approximately 4.7 miles of maintained trails and about 1.7 miles of old roadways within the reservoir area that are open to the public for various activities, including hiking, biking, cross-country skiing, horseback riding, and snowmobiling. Off-road vehicle use is not allowed in the project area.

The Conant Brook project area is well suited to several types of year round recreational use. Numerous old roadways and trails criss-cross the area providing access to relatively undisturbed and pristine areas. Visiting the project to walk or jog through the reservoir accounts for a large portion of the recreational use. The shorelines of the small impoundment and other ponds, plus other open areas, provide scenic views of both natural areas and project features such as the dam and spillway. Several areas along Vinica and Conant Brooks are popular fishing spots, and hunting for deer, stocked pheasant and other small game is common during the fall hunting season. In general, the project provides an excellent area to enjoy primarily passive recreational pursuits in a preserved natural setting.

### **3.4.1 Existing Use**

Although recreational facilities at Conant Brook Dam are limited to about 6.4 miles of maintained trails and old roadways, and several parking areas, visitation to the dam and reservoir area is considered to be fairly high. The following tabulation summarizes visitor attendance at Conant Brook Dam from 1993 to 1997.

#### **HISTORIC VISITATION AT CONANT BROOK DAM**

<u>Year</u>	<u>Visitors</u>
1993	15,800
1994	17,800
1995	21,400
1996	21,800
1997	24,900

As shown above, use of the Conant Brook Dam project has increased in recent years. The majority of usage involves fishing, hunting, sightseeing, hiking, and nature-walking. Trails within the project area are also part of an extensive mountain bike trail system. These trails connect with trails within Brimfield State Forest, and trails on privately owned land west of the project. Due to the type of facilities available at the project, a large portion of current usage occurs during weekends and during the summer when the weather is fair.

### **3.4.2 Natural and Scenic Qualities**

The Conant Brook Dam project is situated in a relatively hilly portion of the Connecticut River Basin headwaters. The reservoir area is diverse; containing a large wetland area, several ponds and streams, and extensive woodlands. These wetland and open water areas, along with the adjacent upland areas, provide conditions suitable for diverse vegetation cover, and support a variety of fish and wildlife species.

The project provides numerous opportunities for excellent scenic views. The overlook area at the dam provides the best views of both project features, and the reservoir area upstream from the dam. Numerous trails and old roadways also provide hikers and other project visitors with scenic views of streams, ponds, and other open and wooded areas throughout the project area.

The combination of topographic relief, open water areas, relative ease of access, and diversity of vegetation and wildlife provide a varied landscape and an aesthetically pleasing experience for visitors. The continuation of management practices that provide for the greatest diversity of indigenous plant and wildlife species, within a multiple use framework, will contribute to maintaining the natural and scenic qualities of this project. Other management practices to be continued are the maintenance of viewing areas, and protection of visually and environmentally sensitive areas.



### **3.4.3 Projected Use**

The demand for recreation at Conant Brook Dam is expected to continue at a high level. This is based on existing and past use of the facility, and the needs identified in the Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP). For purposes of recreational planning, the Commonwealth is divided into seven regions. Conant Brook Dam is located in the Connecticut Valley Region. The Massachusetts SCORP evaluation of trail based activities determined that opportunities to walk, jog, or run were in greatest demand. The SCORP further stated that "While these activities can be done on ordinary sidewalks and streets, the experiences of participants are often enhanced when these activities are undertaken in natural settings such as in areas containing scenic trail systems." Bicycling was also identified as a highly demanded activity, and since bicycle trail systems can meet the needs of walkers, joggers and runners, these trails could serve both functions.

The SCORP also conducted a supply and demand analysis of twelve other activities. These activities were grouped into four activity areas: (1) natural resource based; (2) sports/recreation; (3) water based; and (4) winter based. The following tabulation lists these activities and shows their regional need ranking based on a supply and demand analysis.

#### **CONNECTICUT VALLEY REGION**

##### **Recreational Activity and Need Ranking**

<u>Activity</u>	<u>Need Ranking</u>
<i>Natural Resource Based</i>	
Camping	6
Hiking	12
Picnicking	7
<i>Sports/Recreation</i>	
Field Based Activities	10
Golf	5
Tennis	3
<i>Water Based</i>	
Boating	1
Fishing	8
Swimming	2
<i>Winter Based</i>	
Downhill Skiing	9
Ice Skating	4
Cross Country Skiing	11

Of the activities listed above, hiking, fishing and cross country skiing are relatively

common activities at the project. With the current trend toward non-consumptive outdoor activities, it is anticipated that the SCORP study that is presently underway will identify a higher demand for both hiking and cross country skiing. There should also be a continued high demand for fishing within the region and at the project.

The potential market areas for facilities at Conant Brook Dam were also assessed to determine the population base that is currently served, and will be served in the future. The primary market areas for the dam and reservoir were assumed to be the areas within a 10 and 20 mile radius of the facilities. This is consistent with the SCORP study which indicates that visits for specific activities such as hunting or fishing could be expected from areas within a 15 to 30 minute commute (10 - 20 miles). These market areas are shown on Plate 5. The following tabulation shows the population that was served in 1995, and that which is projected to be served in the years 2000 and 2010.

#### **POPULATION BASE**

<u>Market Area</u>	<u>1995</u>	<u>Population</u>	
		<u>2000</u>	<u>2010</u>
10-mile radius	45,077	46,224	48,628
20-mile radius	435,626	498,111	535,469

Another factor affecting recreational use at Conant Brook Dam is customer satisfaction. Although there is no on-site management at the project, daily use of the area has increased due to preservation of the natural characteristics of the project area. Several trails in the relatively open areas surrounding the dam are particularly popular for walking. The contract with the town of Monson to enforce the ban on use of off-road vehicles has also contributed to the overall satisfaction of people using project lands.

#### **3.4.4 Carrying Capacity**

The carrying capacity for activities at Conant Brook Dam is constrained primarily by parking limitations. At an average of 2.5 people per car and 15 spaces, 38 people can park at the end of the access road and visit the project at any given time. This area is sufficient for project visitors, and although this area has not reach capacity at any time during the year, overflow parking could be provided along the access road. Small parking areas are also situated at the ends of Waterworks, and East Hill Roads, and near the Munn Road dike. These areas tend to be used by local residents familiar with the area.

The 4.7 miles of trails and 1.7 miles of old interior roadways that are maintained throughout the reservoir area are adequate for present visitors. At a design capacity of 32 hikers per mile of trail, there is sufficient trail space for over 200 hikers. Since current usage is less than this standard, existing trails and roadways can easily accommodate a mix of uses, such as hiking and biking.

#### **4. PUBLIC INVOLVEMENT AND COORDINATION**

Coordination with elected officials, other agencies, and the public was conducted as part of the planning process. This insured that the Master Plan provided the best response to local and regional needs, project resource capabilities and suitabilities, and expressed public desires. Public coordination was initiated with the issuance of a Public Notice and a News Release on September 30, 1996. These documents announced the initiation of the study, solicited input, and resulted in a letter from the Monson Bike Route Committee concerning the study (see Appendix A).

During the study, a workshop meeting was held with the Monson Planning Board, the Parks and Recreation Committee, and the Bike Route Committee. This meeting was held in Monson on August 13, 1997.

In addition to the above workshop meeting, a formal public meeting was held at the Monson Town Hall during the evening of August 20, 1997. Concerned interests were well represented at this meeting. Those present included Monson officials, representatives from the Massachusetts Department of Environmental Management and Massachusetts Division of Fisheries and Wildlife, and concerned individuals.

The above meetings and other coordination activities resulted in the following public comments and desires:

1. Recommend a designated bike route that would begin at the access road, cross the dam and connect to East Hill Road. This would complete a three town (Monson-Brimfield-Wales) bike loop that is about 18 miles long. Signs for parking areas and the trail would help communicate trail features. Subsequent to the above meetings, this bike route was established, and a cooperative agreement for trail management was executed between the town of Monson and the Corps on November 3, 1997.

2. Support development of local and cross state hiking and biking trails on Corps property. This would support a goal of Monson's Open Space Plan to link Federal, State, and local properties. As trail systems expand, Corps land could provide the vital link between these properties.

3. Plowing of the access road should continue to allow winter access to the area.

4. Desire that the project area remain in a natural state with continued access for hiking, hunting, fishing, and other passive recreational activities. Recommend continuation of the current State pheasant stocking program.

5. The possibility of developing Squire Pond for activities such as camping, swimming, and picnicking was discussed, but it was agreed that the best use for the area is the present passive recreational use. In addition, access to the pond should be limited as the Corps only owns a portion of the shoreline.

6. Encourage continued vegetative and other management activities to enhance fish and wildlife resources.

## **5. RESOURCE MANAGEMENT OBJECTIVES**

### **5.1 General**

The purpose of this section is to establish resource objectives for the Conant Brook Dam project. Resource objectives are developed to guide future design, development, and management of the natural and man-made resource base; to obtain the greatest possible benefit through meeting the needs of the public; and protecting and enhancing environmental quality and ensuring sustained use.

These objectives are consistent with authorized project purposes, applicable Federal laws and directives, regional needs, resource capabilities, and expressed public desires.

The overall mission is to provide high quality and responsive management of Conant Brook Dam's natural and man-made resources, while maintaining efficient and effective flood control operations.

### **5.2 Project Wide Objectives**

1. Manage project lands to improve vegetation health and vigor for sustained yield for timber production, increased wildlife carrying capacity, and recreation use through maintenance of a diversity of age groups and species, successional control, and timber harvesting.
2. Maintain access to the project area to ensure high quality recreation experiences, and public health and safety.
3. Identify and evaluate the development of potential recreation sites to afford the public a diversity of recreational opportunities and/or enhance public use of project lands.
4. Provide recreation activities for both consumptive (hunting and fishing) and non-consumptive (bird watching and photography) use of fish and wildlife. Continue the current pheasant stocking program.
5. Identify and develop hiking and biking trails through project lands to meet regional needs for formally designated recreational trails, and provide the public with opportunities to view unique natural areas.
6. Maintain a visitor assistance program including interpretation to enhance the public's understanding and appreciation of the role of the Corps of Engineers in development and administration of Conant Brook Dam.

7. Preserve and enhance the natural and beneficial values of wetlands, flood plains and aquifers.
8. Utilize the Conant Brook Dam cultural resource reconnaissance report to preserve and protect cultural resources identified on project lands. Any future construction or operation related activity would be evaluated on a case-by-case basis for potential effects on cultural resources.
9. Protect and conserve the State listed threatened and endangered species, and species of "Special Concern" and have been identified at Conant Brook Dam. Report sightings to the Massachusetts Natural Heritage Program for listing in their records.
10. Implement erosion control measures as necessary to protect water quality and other project resources.

### **5.3 Specific Project Objectives**

1. Continue to coordinate with the town of Monson regarding management of the Brimfield-Monson-Wales Bike Way. A portion of this trail follows the access road, crosses the dam, and connects to East Hill Road. Provide signs to mark both the trail and trail parking areas.
2. Manage and maintain existing flood control facilities to ensure safe and efficient operation of the project while permitting public use at controlled access points.
3. Maintain the access road and parking area as the primary entrance point for project visitors.
4. Continue protection of the Golden Club and its habitat at Duck Pond under the designation of "A Natural Area". Allow limited public access to this area.
5. Maintain hiking, biking, and interpretive trails using old roadways and other existing pathways in the reservoir area. Any trail expansion should avoid the two farmstead sites to maintain their current integrity and low visibility to visitors. The existing parking area at the dam, and small parking areas off Munn Road, and at the ends of Waterworks and East Hill Roads would continue to be used as access points.
6. Consider, on a case-by-case basis, hiking and biking trails that would support a goal of Monson's Open Space Plan to link Federal, State, and local properties.
7. Manage the area to improve the health and vigor of vegetation to increase the value of such areas for wildlife, passive recreation, scenic value, timber harvesting, and wildfire prevention.

## 6. LAND ALLOCATION AND CLASSIFICATION

### 6.1 Land Allocation

As stated in Section 2, the entire Conant Brook Dam project area was initially acquired for flood control purposes. Consequently, all project lands are allocated to the Operations category.

### 6.2 Land Classification

In accordance with U.S. Army Corps of Engineers regulation, ER 1130-2-550, and pamphlet, EP 1130-2-550, these allocated project lands are further classified to provide for development and resource management consistent with authorized project purposes, and the provisions of the National Environmental Policy Act (NEPA) and other Federal laws. Land classification categories are described below:

- Project Operations - This classification includes land required for flood control structures, administration and maintenance facilities, and operation of the project.
- Recreation - Land developed for intensive recreational activities by the visiting public.
- Mitigation - This includes land acquired or designated specifically for mitigation. No areas at Conant Brook Dam are classified in this category.
- Environmental Sensitive Areas - Areas where scientific, ecological, cultural, or aesthetic features have been identified.
- Multiple Resource Management - Lands managed for one or more of, but not limited to, the following activities:
  - a. Recreation - Low Density. Activities such as hiking, primitive camping, wildlife observation, hunting, or similar low density recreational pursuits.
  - b. Wildlife Management General. Fish and wildlife management activities.
  - c. Vegetative Management. Management activities for the protection and development of forest and vegetative cover.
  - d. Inactive and/or Future Recreational Areas. Recreation areas planned for the future or temporarily closed.

- Easement Lands - All lands for which the Corps holds an easement interest but not fee title.

The following paragraph describes the classification of land at Conant Brook Dam. Previous sections concerning Conant Brook Dam's purpose, available natural and recreation resources, and development constraints and opportunities, provided the basis for this land classification.

The total project area of approximately 456 acres has been classified as follows: (1) about 40 acres project operations; (2) about 9 acres environmentally sensitive; (3) about 2 acres recreation; and (4) about 405 acres multiple resource management. As shown on Plate 6, the area classified as project operations includes about 36 acres at the dam and access road, and about 4 acres at the Munn Road dike. These areas are required for effective operation of the project. The area classified as environmentally sensitive includes Duck Pond and a buffer zone surrounding the pond. Protection of this area will continue to contribute to protection of the endangered species, Golden Club. The 2 acre recreation area is situated immediately east of the dam and includes the parking area and overlook. As the remaining areas are used for hiking, biking, fishing, and hunting, the area's primary use will be low density recreation.



## **7. RESOURCE DEVELOPMENT PLANS**

Conant Brook Dam should continue to be used primarily for day use recreation. In addition, since nearly all visitors come from within 20 miles of the project, the needs of the people within this area should continue to guide recreation development at the project. Operation and maintenance of the damsite and other flood control improvements, and management of the reservoir area will continue to be the responsibility of the Corps of Engineers. The following paragraphs describe improvements and opportunities to meet the short and long term recreational and other needs at Conant Brook Dam.

- Continue to coordinate with the town of Monson regarding management of the Brimfield-Monson-Wales Bike Way. This trail follows the access road, crosses the dam, and connects to the end of East Hill Road (see Plate 7). The existing parking area at the dam and small parking area at the end of East Hill Road would continue to be used as access points.
- Provide signage to identify Corps parking areas, and hiking and biking trails.
- Consider the development of local and cross state hiking and biking trails to link Federal, State, and local properties. This has been identified as a basic goal of the Open Space Plan that is being prepared by the town of Monson.

Recreation improvements, and fish and wildlife enhancement activities will need to be accomplished by sharing costs with public or private agencies or groups. New recreation development is possible if developed and maintained by other public or private agencies. Improvements or development will require specific proposals for Corps review and approval.

## 8. CONCLUSIONS

This Master Plan provides guidance for future development at Conant Brook Dam. The natural and man-made resources at the project will continue to be managed to provide the best combination of responses to regional and ecosystem needs, project resource capabilities and suitabilities, and public desires consistent with the project's authorized flood control purpose. The New England District will continue to be responsible for the administration and management of the project's 456 acres.

Natural and man-made resources have been identified and analyzed. This included wetlands, exemplary natural communities, and cultural resources which require specific management efforts for their protection. Recreational opportunities were identified through an analysis of regional needs and expressed public desires.

Through land use classification, the Master Plan has designated areas for project operations, recreation, environmental protection, and multiple resource management. About 36 acres in the vicinity of the dam and 4 acres at the Munn Road Dike will be reserved for project operations. The access road parking lot and adjacent area (2 acres) has been classified as intensive recreation. Due to the presence of Golden Club, a State listed threatened species, at Duck Pond, a nine (9) acre area encompassing the pond has been classified as environmentally sensitive.

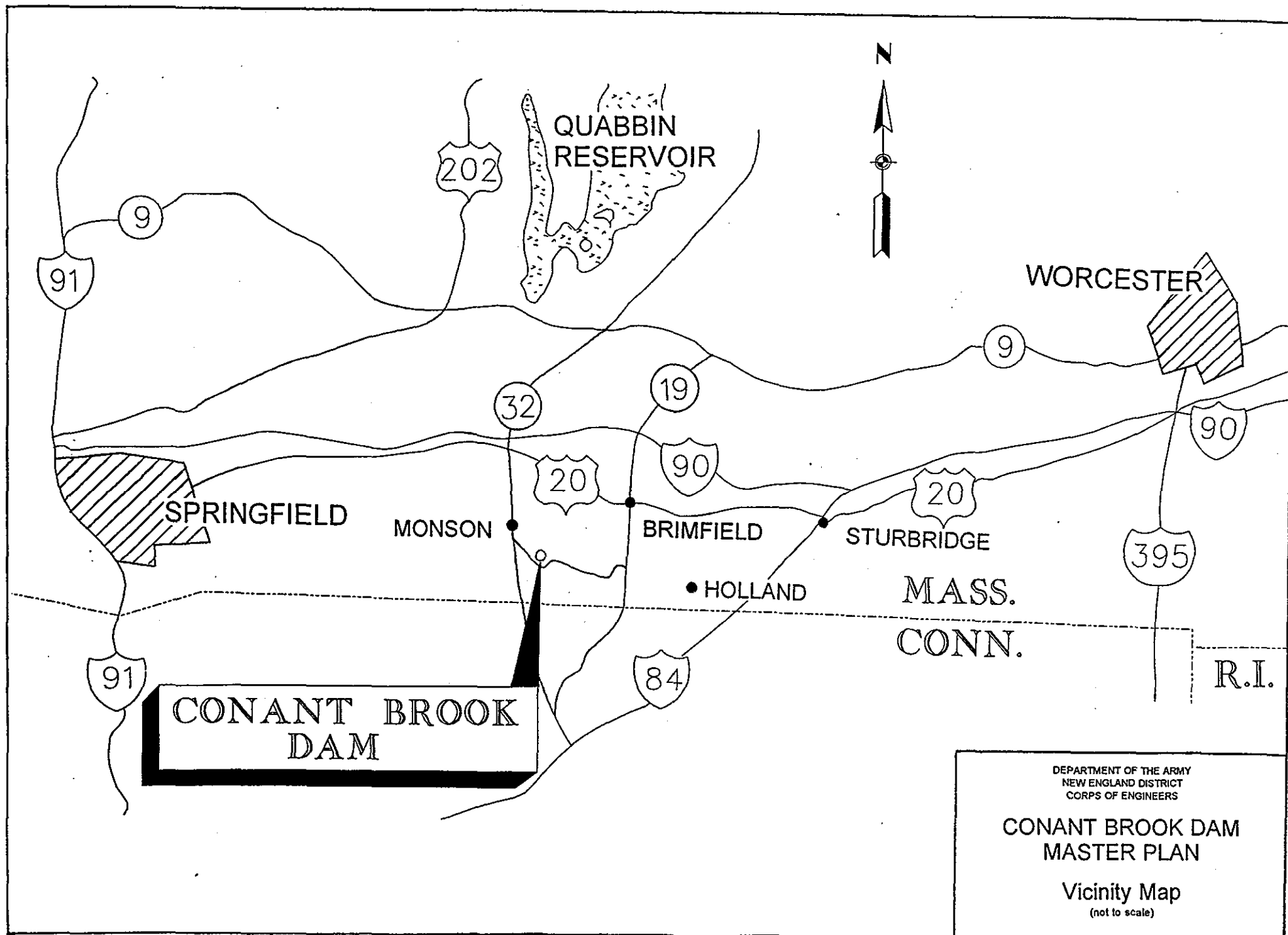
During preparation of this Master Plan, the need to complete the Brimfield-Monson-Wales Bike Way was identified, and on November 3, 1997, a trail management agreement was executed with the town of Monson to meet that need. The Master Plan also identified a basic goal of the Monson Open Space Plan study to link Federal, State, and local properties as part of their Open Space Plan. Although the Town study was incomplete when this Master Plan was completed and specific recommendations had not been developed, any proposals involving Corps property will need to be evaluated on a case by case basis. Present levels of operation and maintenance should also be continued to ensure high quality recreational experiences, protection of fish and wildlife resources, and continued public health and safety.

All specific proposals for recreational or other development at the project must comply with this Master Plan, the Connecticut River Basin flood control requirements, and the National Environmental Policy Act and other Federal requirements.

## **9. RECOMMENDATIONS**

It is recommended that the Conant Brook Dam Master Plan be approved as a guide to the orderly use and development of natural and man-made resources at the Conant Brook Dam flood control project. Approval of this Master Plan would rescind the "Conant Brook Dam Master Plan for Recreation Resources Development", dated April 1979.







SCALE: 1" = 1,000'

## LEGEND

— · — Project Boundary

### PALUSTRINE SYSTEM

- POW - Open Water, Less Than 20 Acres (0.8 acres)
- PAB1 - Aquatic Bed Vegetation, rooted vascular (5.1 acres)
- PAB2 - Aquatic Bed Vegetation, floating vascular (16.8 acres)
- PEM1 - Emergent Vegetation, persistent (10.1 acres)
- PEM2 - Emergent Vegetation, nonpersistent (2.4 acres)
- PM - Moss Wetland (0.5 acres)
- PSS1 - Shrub/Scrub Broad-Leaved Deciduous (17.2 acres)
- PFO1 - Forested Broad-Leaved Deciduous (13.4 acres)
- PFO4 - Forested Needle-Leaved Evergreen (1.6 acres)

### RIVERINE SYSTEM

- R - Open Water Contained Within A Channel (1.5 miles)
- RAB1 - Aquatic Bed Vegetation, rooted vascular (0.5 acres)
- REM1 - Emergent Vegetation, persistent (1.6 acres)
- REM2 - Emergent Vegetation, nonpersistent (1.1 acres)
- Intermittent Stream (1.2 miles)

### NON-WETLAND

- U - Upland
- .. 1/4 - Beaver Dam

### MODIFIERS

- \* - Sphagnum & associated bog community area
- △ - Marsh, Semipermanently flooded
- - - - Wet Meadow, Seasonally flooded
- o - Standing, mostly dead deciduous/evergreen forest
- VP? - Possible Vernal Pool

## WETLAND MAP

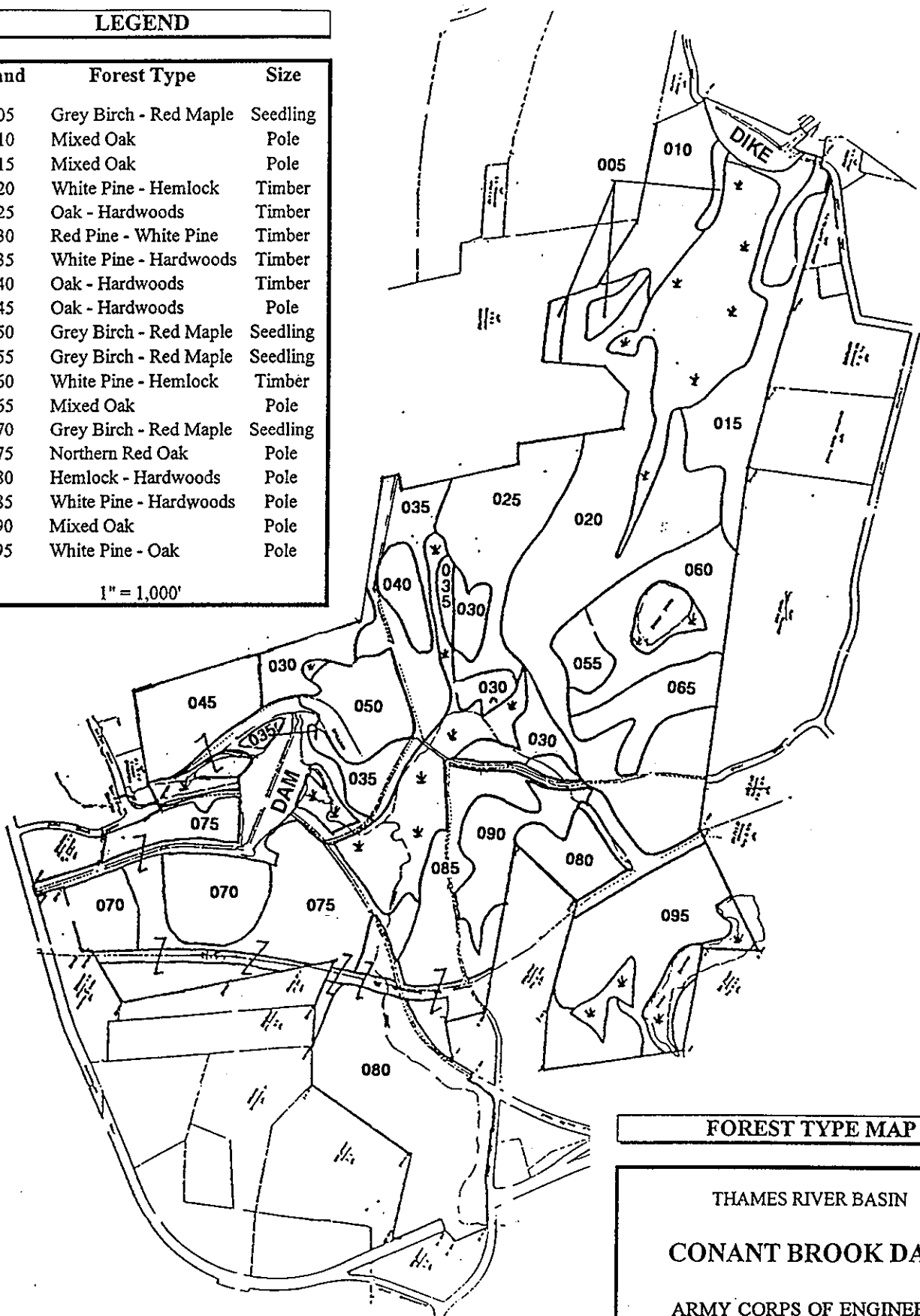
LOWER CONNECTICUT RIVER BASIN  
**CONANT BROOK DAM**

ARMY CORPS OF ENGINEERS  
NEW ENGLAND DIVISION  
WALTHAM, MASSACHUSETTS

# LEGEND

Stand	Forest Type	Size
005	Grey Birch - Red Maple	Seedling
010	Mixed Oak	Pole
015	Mixed Oak	Pole
020	White Pine - Hemlock	Timber
025	Oak - Hardwoods	Timber
030	Red Pine - White Pine	Timber
035	White Pine - Hardwoods	Timber
040	Oak - Hardwoods	Timber
045	Oak - Hardwoods	Pole
050	Grey Birch - Red Maple	Seedling
055	Grey Birch - Red Maple	Seedling
060	White Pine - Hemlock	Timber
065	Mixed Oak	Pole
070	Grey Birch - Red Maple	Seedling
075	Northern Red Oak	Pole
080	Hemlock - Hardwoods	Pole
085	White Pine - Hardwoods	Pole
090	Mixed Oak	Pole
095	White Pine - Oak	Pole

1" = 1,000'

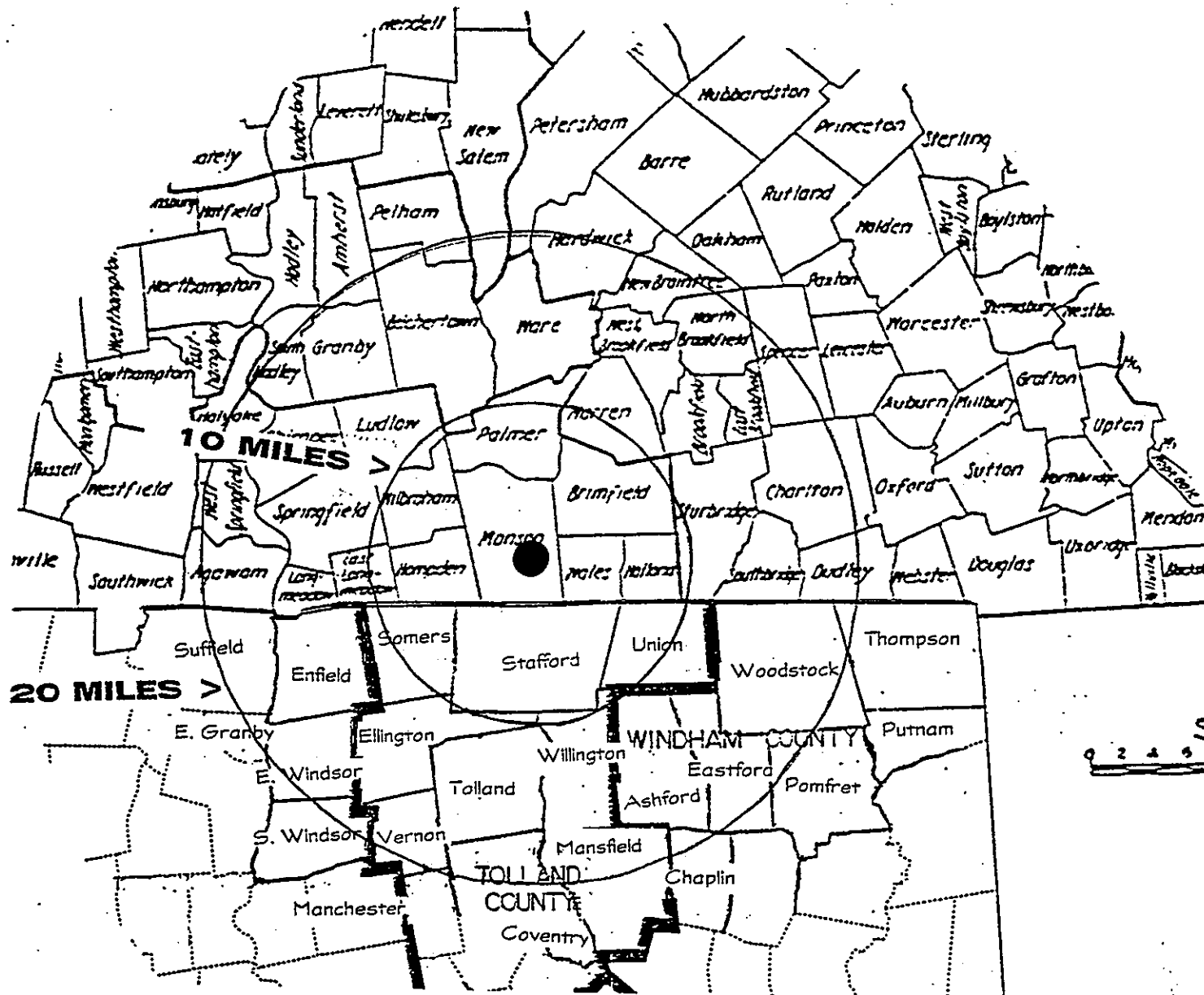


## FOREST TYPE MAP

THAMES RIVER BASIN

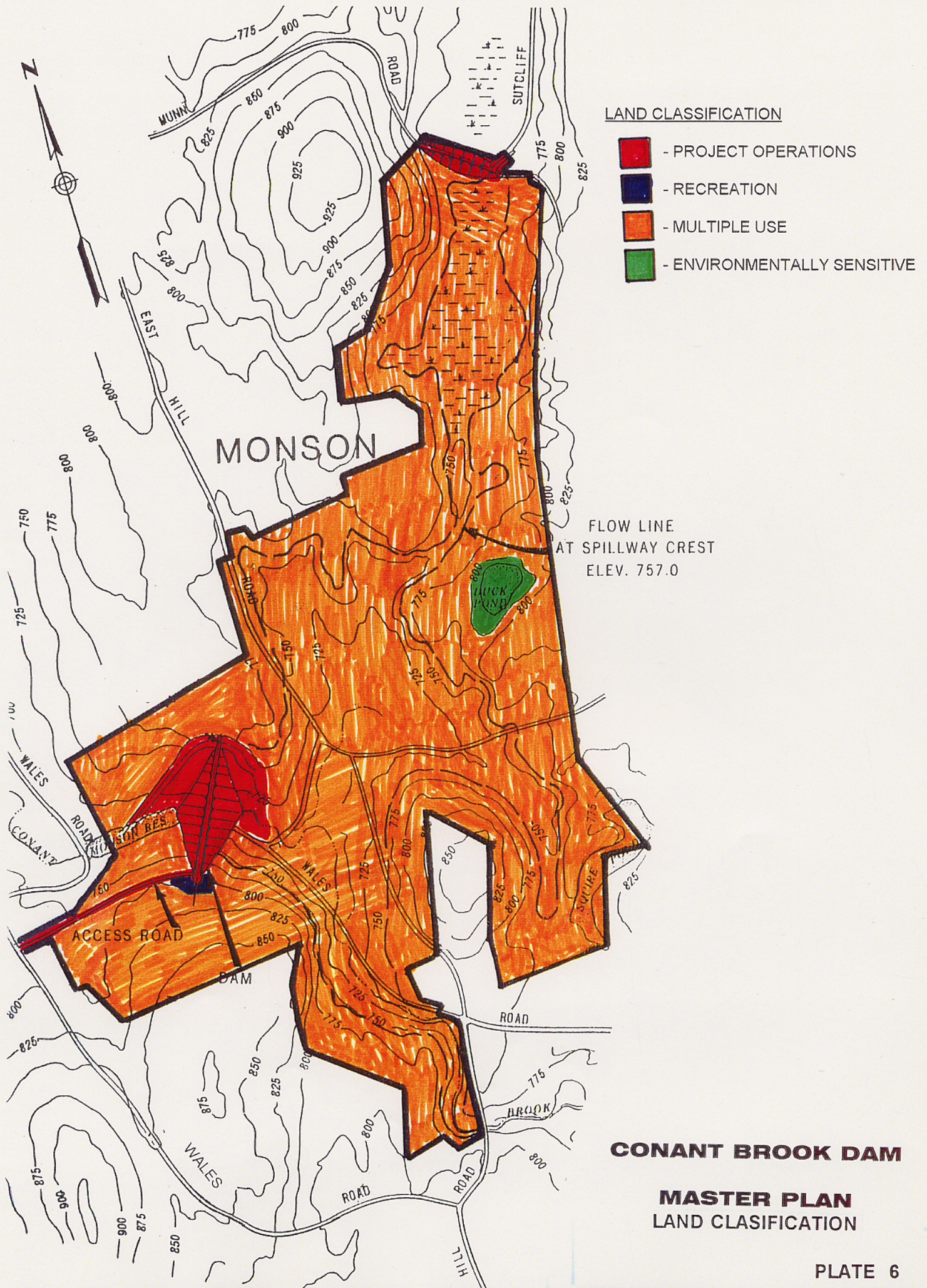
## CONANT BROOK DAM

ARMY CORPS OF ENGINEERS  
NEW ENGLAND DISTRICT  
WALTHAM, MASSACHUSETTS

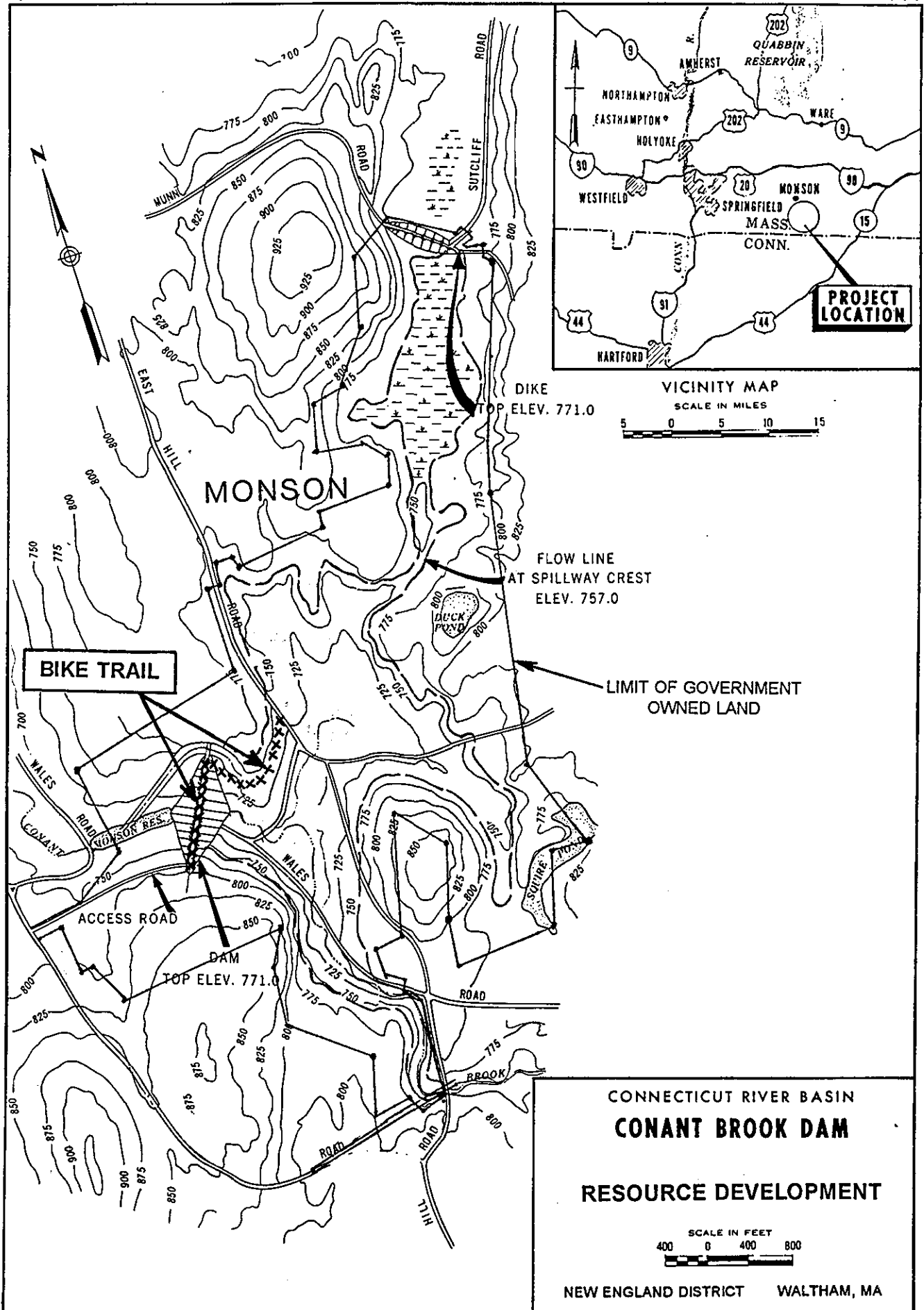


# **CONANT BROOK DAM MARKET AREA**









Appendix A

Pertinent Correspondence



# Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

July 27, 1998

U.S. Army Corps of Engineers  
New England District  
ATTN: Mr. Richard Heidebrecht (Planning Branch)  
696 Virginia Road  
Concord, MA 01742-2751

Dear Mr. Heidebrecht:

Thank you for the opportunity to comment on the draft Master Plan for Conant Brook Dam. The synopsis in the Plan of the interim results of the inventory for rare species and exemplary plant communities contracted to this office by the ACOE - NED was well done, and the continued protections recommended for Duck Pond are impressive. Below I provide updates on occurrences of rare species and vernal pools from the pre-final report submitted last December, and some comments on other aspects of natural resource management in the Plan.

The Corps of Engineers is to be commended for incorporating ecosystem management principles in its management objectives (p. 1) and concern for biodiversity (p.18) including recognition throughout the draft Master Plan of the importance of maintaining native species (for example on p.26). Through the Commonwealth's Biodiversity Initiative, the Division of Fisheries & Wildlife has been stressing the need to have a landscape perspective when planning the management of any area. We encourage maintaining the most appropriate species on any property and considering what other habitat occurs in the area before habitat manipulation is undertaken. For example, creating "wildlife habitat openings" is not necessary near open areas on surrounding properties. In that case, maintaining unfragmented forests might be the most appropriate use of land, from a wildlife and biodiversity perspective.

**Resource inventories and analysis, surface waters and wetlands.** p. 16 Somewhere in this section would be a good place to discuss the three vernal pools identified in the rare species inventory and in the aerial photography interpretation of the wetland communities (Appendix B). It is reassuring that the vernal pools identified during the inventory appear to be the same as those identified through the interpretation of the aerial photography. The aerial interpretation and its ground truthing also identified portions of wetlands along Vinica Brook with ponding that supported salamander eggs: these ponded areas also function as vernal pools. Vernal pools are part of the wetland system and support several species of wildlife that depend on them. They should be maintained, and if logging occurs around them, equipment should avoid going into them, slash removed and a buffer left for shade. The current uses of the property are compatible with the vernal pools, except that two have had trash dumped in them.



## Natural Heritage & Endangered Species Program

Route 135, Westborough, MA 01581 Tel: (508) 792-7270 x 200 Fax: (508) 792-7275  
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement  
<http://www.state.ma.us/dfwele>

The wetland south of Munn Road supports a population of a state Endangered dragonfly, the Spring Blue Darner (*Aeshna mutata*). This species also occurs at Duck Pond. Current management practices are maintaining the species.

The lack of aquatic weeds at Conant Brook is important, and increases the inherent value for conservation of native species. If a weed problem does occur, it is important to consider what is meant by the word "weed," and why such a species is becoming a problem. Invasive non-native species should be controlled when possible, but it would be important to identify why such species have been able to become established. Control of plant or animal species is more likely if causes of establishment are themselves corrected; for example nutrient enrichment stopped or siltation reduced. Native species may become pests in similar conditions. However, some native species could be considered to be weeds or pests as a result of natural succession, and control in such conditions should only be undertaken after serious deliberation and study of the regional vegetation.

p.18 (and p.20) Duck Pond continues to support the best population of Golden Club at any site in the state, and deserves the extra protection provided by the Corps (which is appreciated by all who care for the biodiversity of the Commonwealth). However, the NHESP fact sheet on Golden Club is somewhat confusing: Golden Club occurs in three towns, not three stands (one town has a lot of ponds with populations of the plant). So, the language on p.18 of the draft Master Plan, top paragraph, second to last sentence, should be deleted. Golden Club continues to be listed as Threatened by Massachusetts. Duck Pond also supports important populations of two state protected dragonflies.

**3.2.3 Vegetative Cover Forest Lands.** The Corps recent forest inventory is important for biodiversity planning as well as the timber management. Where any forest is being timbered, issues of fragmentation and wildlife management need to be considered in the planning, such as are implicit in the multiple use philosophy. If a diversity of forest ages is an aim, then it would be most useful to keep the youngest areas young, and let the oldest sections mature. Those sections of forest that are oldest are worth noting and maintaining for biodiversity and aesthetics. The draft Master Plan carefully notes the limits that soil can place on stand quality and appropriately recommends concentrating efforts for forest improvement, for timber, in areas with the best potential. Natural vegetation in the "lower quality" areas may be the best use of the land. The forests of the property will change, white pine, gray birch, and red maple are being naturally replaced by later successional hard woods. Red Pine is not native to southern Massachusetts, and plantations have much less biodiversity than do naturally regenerating forests: as the red pine is harvested or dies, it would be most beneficial to the forest diversity to let natural regeneration occur. If plantations are to be maintained on the property, then current plantations are the appropriate place, not somewhere currently more diverse. The borrow pits are, of course, a conundrum, because of their poor nutrient condition, but do support, and will do so for some time, early successional vegetation and related animals.

The idea of wildlife habitat is brought up several times in this section. The phrase, wildlife habitat, is somewhat ambiguous given the variety of wildlife species and their needs. The stated need to increase acorns for acorn dependent wildlife species is more specific, and if done would yield such species in the long term, at the cost of some harvesting of oaks, and perhaps some other species that eat other fruits.

There is a minor typo on p. 19, paragraph above Open Lands: *Viburnum acerifolium* 'r - i', not 'n'.

p. 19, **Open Lands.** The acreage of open lands is relatively small, and has not attracted the bird species considered to be grassland specialists. While the draft Master Plan encourages maintaining them and acquiring, or making, more, we recommend addressing the needs for early successional vegetation while not fragmenting older forest. Openings for edge species should occur near existing disturbances, and not disrupt larger tracts of forest. If openings are desired, then appropriate sites include former

agricultural fields adjacent to existing fields or other open-land habitats at or near the periphery of extensive forestlands as stated in the draft Master Plan. A contribution that a naturally forested state can make to global biodiversity is to support species specializing in forest.

As noted in the draft Master Plan, regional perspective is useful for adjusting the management of a property to include consideration of habitats available on surrounding properties. When open fields are to be habitat for grassland birds, we recommend not mowing in the spring until after July 15, to allow ground nesting birds to raise their young, but this is not relevant because no grassland birds were present. The gas line right of way currently supports plant species of openings, including a state protected plant. Current management maintains this and other native species there. Control of off road vehicles in the right of way, as discussed on p.16, would benefit these plants as well.

**Exemplary Natural Communities of Local Significance**, p.20. The importance of Duck Pond is enhanced by the finding of two species of state protected dragonflies there. The Golden Club, is one of 11 stands, in 3 towns (sorry about the ambiguity in our fact sheet). This is a good, brief description of this important site. The vernal pools can also be considered communities of local significance.

**Wildlife**, p. 21 has a nice synopsis of the results given in the interim report we submitted on rare species and exemplary communities, as well as other information. The following additions are updates from the pre-final report.

Invertebrate survey: Two common species of freshwater mussel were identified on the property, neither having large populations. The Conant Brook Dam property does not have prime mussel habitat, the streams being turbid and silty. The final list of moths included 163 species and there were 33 species of Odonates (21 species of dragonflies and 12 of damselflies).

While the concern about open fields has been addressed above, it is worth reiterating that edge habitat also naturally occurs along the streams, rivers, wetlands, and roads of the property. Many of the bird species on the site use this sort of habitat.

**Rare, Threatened and Endangered Species**, p. 22 one additional plant species and a second location on site for the Spring Blue Darner were reported on the property. A small population of Slender Blue-eyed Grass, *Sisyrinchium mucronatum*, state Threatened, occurred along the pipeline and an additional population of Spring Blue Darner occurred in the wetland south of Munn Road. No changes in management are recommended for these sites, current management practices are working fine.

**Recreation Resources**, p.25 might emphasize that the property is not open to ORV use, and reiterate the enforcement needs discussed earlier in the draft Master Plan, also to be reinforced in the discussion of trails on p.28 and 31.

p. 26. We appreciate the sensitivity throughout the Master Plan shown by the use of the phrase "indigenous plant and wildlife." It supports our concern for maintaining habitats for appropriate native biological diversity.

**Resource Management Objectives**, p.31, in objective 1, to manage project lands for..."increased wildlife carrying capacity" could have unintended results if individual species are targeted. I reiterate our normal recommendation of managing for appropriate native biodiversity and looking at the landscape setting when establishing management goals for diversity of timber age groups and succession.

p.32. #9 and #4 below - A strong recommendation for protecting the state listed species of the property, and we appreciate the suggestion that sightings of rare species be reported to us.

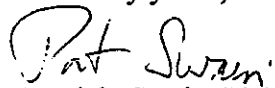
p.34, a minor typo 5th line from bottom duck pond should read Duck Pond.

**Resource Development Plan**, p.35. Despite this agency's strong support for fishing and wildlife experiences, we recommend caution about certain "fish and wildlife enhancement activities". Adding non-native species can cause problems for the natives, even as food sources or for habitat. We are also often concerned that populations of native species not be increased by addition of individuals from other gene pools that might not be adapted to local conditions. Manipulation of the habitat should be done with a consideration of the landscape, not just the property, and with awareness of maintaining the strengths of the area as an unfragmented forest.

Plate 7 shows the proposed bike trail over the dam. This will need to be situated carefully to avoid the best vernal pool.

I hope these rather detailed comments are useful. The draft Master Plan has included sensitivity to maintaining and protecting the rare and uncommon species and the natural communities of the Conant Brook Dam property. These suggestions are based on the detailed information of the site that we were able to gain through the Corps' funding of the inventory.

Sincerely yours,

  
Patricia Swain, Ph.D.

Plant Community Ecologist

June 30, 1998

Engineering/Planning Division  
Planning Branch

1~

Dear 2~:

The purpose of this letter is to forward a copy of the draft Conant Brook Dam Master Plan for your review and comment. The report documents the evaluation of the natural and developed resources of the project, assessment of regional needs and expressed public desires, and development of an overall land and water management plan for the project.

Public desires were identified through comments received as a result of public notices and news releases, input received at a workshop meeting with Monson officials, and a formal public meeting held in Monson, Massachusetts.

All comments should arrive at the following address no later than July 31, 1998, to ensure consideration for inclusion in the final report.

U.S. Army Corps of Engineers, New England District  
ATTN: Mr. Richard Heidebrecht (Planning Branch)  
696 Virginia Road  
Concord, Massachusetts 01742-2751

A copy of this letter and the draft Master Plan will be hand-carried to the Monson library for posting. If you have any questions or require additional information, please contact Mr. Richard Heidebrecht at (978) 318-8513.

Sincerely,

H. Farrell McMillan, P.E.  
Chief, Engineering/Planning Division

Enclosure

3~



SAME LETTER TO:

Mr. Wayne F. McCallum, Director  
Commonwealth of Massachusetts  
Division of Fisheries and Wildlife  
Leverett Saltonstall Building  
100 Cambridge Street  
Boston, Massachusetts 02202

Mr. Ralph Taylor, District Supervisor  
Connecticut Valley Wildlife District  
Massachusetts Division of Fisheries and Wildlife  
341 East Street  
Belchertown, Massachusetts 01107

Mr. Chris Turlow, District Supervisor  
Central Wildlife District  
Commonwealth of Massachusetts  
Division of Fisheries and Wildlife  
221 Temple Street  
West Boylston, Massachusetts 01583

Mr. David Basler, Fisheries Biologist  
Commonwealth of Massachusetts  
Division of Fisheries and Wildlife  
341 East Street  
Belchertown, Massachusetts 01007

Mr. John Sheppard  
Public Access Board  
Commonwealth of Massachusetts  
Department of Fisheries, Wildlife  
and Environmental Law Enforcement  
100 Nashua Street  
Boston, Massachusetts 02114

Mr. Peter Webber, Commissioner  
Commonwealth of Massachusetts  
Department of Environmental Management  
100 Cambridge Street  
Boston, Massachusetts 02202

Mr. Howard Fife  
Department of Environmental Management  
Brimfield State Forest  
P.O. Box 170  
Brimfield, Massachusetts 01010

Dr. Patricia Swain, Ph.D  
Plant Community Ecologist  
Natural Heritage and Endangered Species Program  
Massachusetts Division of Fisheries and Wildlife  
Route 135  
Westborough, Massachusetts 01581

Mr. Kurt Kaiser, Chairman  
Board of Selectmen  
Town of Monson  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

Copy Furnished:  
Planning Board  
Conservation Commission  
Recreation Commission

Mr. Edward S. Harrison  
Board of Selectmen  
Town of Monson  
23 Paradise Lake Road  
Monson, Massachusetts 01057

Mr Paul Hatch  
Monson Planning Board  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

Mr. James Duggan, Director  
Parks and Recreation Commission  
Town of Monson  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

Ms. Gretchen E. Neggers  
Town Administrator, Town of Monson  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

Ms. J. Porwoll  
Monson Conservation Commission  
P.O. Box 261  
Monson, Massachusetts 01057

Ms. Mary T. Hull, Chairman  
Monson Bike Route Committee  
26 Country Club Heights  
Monson, Massachusetts 01057

Mr. Stanley J. Soja, Jr.  
Monson Bike Trail Committee  
2 Silver Street  
Monson, Massachusetts 01057



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02254-9149

August 8, 1997

ANNOUNCEMENT OF PUBLIC MEETING  
FOR  
MASTER PLAN UPDATE  
CONANT BROOK DAM FLOOD CONTROL PROJECT  
MONSON, MASSACHUSETTS

The New England District of the U.S. Army Corps of Engineers is updating the existing Master Plan at its Conant Brook Dam flood control project in south central Massachusetts. The Conant Brook Dam project area encompasses approximately 456 acres in the town of Monson. The purpose of the study is to assess the natural and developed resources of the project, determine regional needs and public desires, and develop an overall land and water management plan for the project. The study is scheduled for completion in the fall of 1997.

You are invited to participate in the following public meeting. Preliminary results of the study will be presented, and the public will be invited to provide their input to the Master Plan.

Conant Brook Dam Master Plan Meeting  
August 20, 1997 at 7:00 p.m.  
Conference Room  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

If you have any questions or require additional information, please contact the Study Manager, Mr. Richard Heidebrecht, at (617) 647-8513.

August 8, 1997

Engineering/Planning Division  
Planning Branch

1~

Dear 2~:

The New England District of the U.S. Army Corps of Engineers is updating the existing Master Plan at its Conant Brook Dam flood control project in south central Massachusetts. The Conant Brook Dam project area encompasses approximately 456 acres in the town of Monson. The purpose of the study is to assess the natural and developed resources of the project, determine regional needs and public desires, and develop an overall land and water management plan for the project. The study is scheduled for completion in the fall of 1997.

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August 20, 1997 at 7:00 p.m.  
Conference Room  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057

If you have any questions or require additional information, please contact the Study Manager, Mr. Richard Heidebrecht, at (617) 647-8513.

Sincerely,

Richard D. Reardon, P.E.  
Chief, Engineering/Planning Division

3~

SAME LETTER TO:

Mr. Wayne F. McCallum, Director  
Division of Fisheries and Wildlife  
Leverett Saltonstall Building  
100 Cambridge Street  
Boston, Massachusetts 02202

Mr. Ralph Taylor, District Supervisor  
Connecticut Valley Wildlife District  
Division of Fisheries and Wildlife  
East Street  
Belchertown, Massachusetts 01107

Mr. Chris Turlow, District Supervisor  
Central Wildlife District  
Division of Fisheries and Wildlife  
221 Temple Street  
West Boylston, Massachusetts 01583

Mr. John Sheppard  
Public Access Board  
Department of Fisheries, Wildlife and  
Environmental Law Enforcement  
100 Nashua Street  
Boston, Massachusetts 02114

Mr. Peter Webber, Commissioner  
Department of Environmental Management  
100 Cambridge Street  
Boston, Massachusetts 02202

Mr. Howard Fife  
Department of Environmental Management  
Wells State Park  
P.O. Box 602  
Sturbridge, Massachusetts 01566

Mr. Kurt Kaiser, Chairman  
Board of Selectmen  
Town of Monson  
Municipal Town Office Building  
110 Main Street  
Monson, Massachusetts 01057  
cf: Planning Board  
Conservation Commission  
Recreation Commission

Ms. Mary T. Hull, Chairman  
Monson Bike Route Committee  
26 Country Club Heights  
Monson, Massachusetts 01057

Patricia Swain, Ph.D  
Plant Community Ecologist  
Natural Heritage and Endangered Species Program  
Division of Fisheries and Wildlife  
Route 135  
Westborough, Massachusetts 01581

MARY T. HULL  
MONSON BIKE ROUTE COMMITTEE  
26 COUNTRY CLUB HEIGHTS  
MONSON, MA. 01057  
1-413-267-4658

NOVEMBER 18, 1996

MR. JOSEPH IGNAZIO  
DIRECTOR OF PLANNING  
DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENG.  
424 TRAPELO ROAD  
WALTHAM, MASS. 02254-9149

DEAR MR. IGNAZIO,

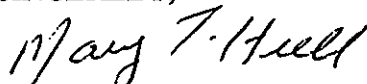
IN RESPONSE TO YOUR REQUEST FOR INFORMATION TO YOUR STUDY OF A MASTER PLAN FOR THE CONANT BROOK DAM PROJECT. WE, THE MONSON BIKE ROUTE COMMITTEE, HAVE ENCLOSED YOUR MAP WITH A ROUTE USING THE CONANT BROOK DAM AREA. THE ROUTE WOULD INCORPORATE NON-MOTORIZED TRANSPORTATION FROM RT. 32 IN MONSON TO RT. 20 IN BRIMFIELD. THIS ROUTE WOULD ALSO BE USED FOR MANY OTHER ACTIVITIES, (SUCH AS HIKING, CROSS COUNTRY SKIING, BIRD WATCHING AND WALKING) FOR PEOPLE OF ALL AGES AND ABILITIES.

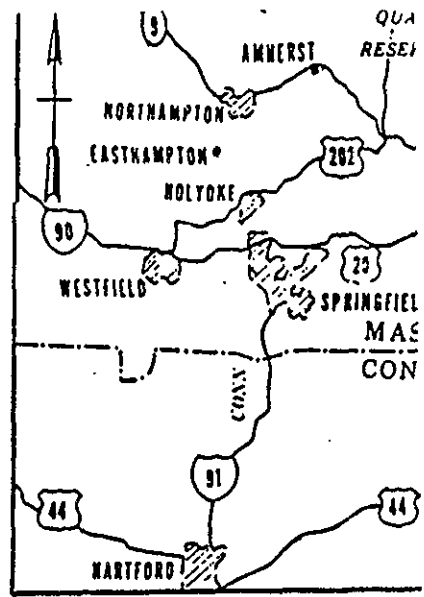
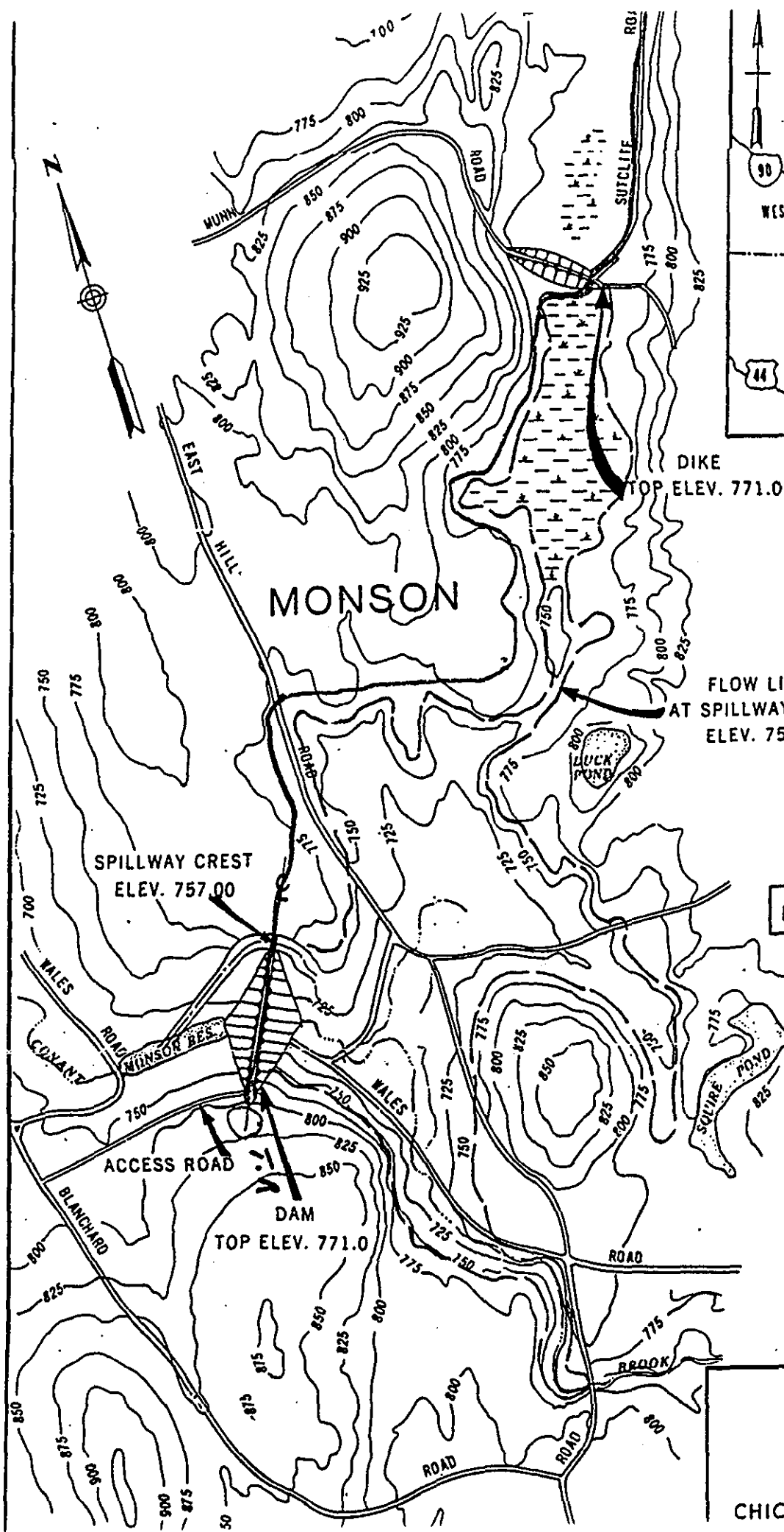
OTHER POSSIBILITIES THAT COULD BE CONSIDERED FOR THE CONANT BROOK DAM AREA WOULD BE THE DEVELOPMENT OF SQUIRE POND FOR FISHING, CAMPING, PICNICKING, SWIMMING, ICE-SKATING, BIRD WATCHING (DUCKS, BLUEHERON, TURKEY, SNOWGEESE, ETC.) AND SNOWSHOEING. THIS AREA IS VERY SCENIC AND IS A NATURAL HABITAT.

OUR TRAIL INCORPORATING THIS AREA WOULD BE A BIKE CORRIDOR TO CONNECT OTHER ESTABLISHED OR PROPOSED BIKE ROUTES.

THANK YOU FOR INFORMING US OF YOUR PROJECT AND IF WE MAY BE OF ANY ASSISTANCE TO YOU AND YOUR PROJECT PLEASE DO NOT HESITATE TO LET US KNOW.

SINCERELY,

  
MARY T. HULL,  
CHAIRMAN, MONSON BIKE ROUTE  
COMMITTEE



RES. CAPACITY= 3740 (a)

CONNECTICUT RIVER  
**CONANT BROOK**  
RESERVOIR M  
CHICOPEE RIVER MA



September 30, 1996

Planning Directorate  
Formulation Division

Dear :

This is to inform you that the New England Division of the U.S. Army Corps of Engineers has initiated a master planning study at its Conant Brook Dam project in south central Massachusetts. The dam and flood impoundment area are located along Conant Brook in Monson. The purpose of the study is to develop an overall management plan for the project based on an evaluation of natural and manmade resources, regional needs, and public desires. The study is scheduled for completion in July 1997.

Copies of the Public Notice and News Release are enclosed for your information. They have been forwarded to the Federal Congressional delegation and the news media.

At this time we are requesting any comments or other input that you may have concerning existing conditions, present or future programs, or other information that may assist us in developing a management plan for the project.

If you have any questions concerning the investigation, please do not hesitate to contact Mr. Richard Heidebrecht, the Study Manager, at (617) 647-8513.

Sincerely,

Joseph L. Ignazio  
Director of Planning

Enclosures

C/PPB

cc:

R. Heidebrecht, 114N

C/FD

Ignazio/reading

Reading

FD Files, 114S (LOCALLTR.MRG)

D/PLNG

Same Letter To:

Honorable Robert D. Wetmore  
Massachusetts Senate  
State House, Room 409  
Boston, MA 02133

Honorable Patrick Landers  
Massachusetts House of  
Representatives  
State House, Room 134  
Boston, MA 02133

Mr. Wayne F. McCallum, Director  
Division of Fisheries and Wildlife  
Leverett Saltonstall Building  
100 Cambridge Street  
Boston, MA 02202

Mr. Ralph Taylor, District Supervisor  
Connecticut Valley Wildlife District  
East Street  
Belchertown, MA 01107

Mr. Chris Turlow, District supervisor  
Central Wildlife District  
221 Temple Street  
West Boylston, MA 01583

Mr. John Sheppard  
Public Access Board  
Department of Fisheries, Wildlife and  
Environmental Law Enforcement  
100 Nashua Street  
Boston, MA 02114

Nr. Peter Webber, Commissioner  
MA Department of Environmental Management  
100 Cambridge Street  
Boston, MA 02202

MA Department of Environmental Management  
Division of Forests and Parks  
P.O. Box 484  
Amherst, MA 01004

Mr. Howard Fife  
MA Department of Environmental Management  
Wells State Park  
P.O. Box 602  
Sturbridge, MA 01566

Board of Selectmen  
Town of Monson  
Monson, MA 01057

Ms. Mary T. Hull  
Monson Bike Route Committee  
26 Country Club Heights  
Monson, MA 01057

September 27, 1996

Planning Directorate  
Formulation Division

Honorable Edward M. Kennedy  
United States Senate  
Washington, DC 20510-2101

Dear Senator Kennedy:

I am writing to inform you that the New England Division of the U.S. Army Corps of Engineers has initiated a study to update the existing Master Plan at its Conant Brook Dam project in south central Massachusetts. The dam and flood impoundment area are located along Conant Brook in Monson. The purpose of the study is to develop an overall management plan for the project based on an evaluation of natural and manmade resources, regional needs, and public desires. The study is scheduled for completion in July 1997.

Copies of the Public Notice and News Release are enclosed for your information. They will be forwarded to concerned governmental and other interests, and the media to solicit information and/or comments concerning the study.

If you have any questions concerning the investigation, please do not hesitate to contact me at (617) 647-8222. Mr. Richard Heidebrecht is the Study Manager. He can be reached at (617) 647-8513.

Sincerely,

J. Michael Bradbury  
Lieutenant Colonel, Corps of Engineers  
Deputy Division Engineer

Enclosures

Copy Furnished:  
Honorable Edward M. Kennedy  
United States Senator  
2400 JFK Federal Building  
Boston, Massachusetts 02203

SAME LETTER SENT TO THE FOLLOWING:

Copy Furnished:

Honorable John F. Kerry  
United States Senate  
Washington, DC 20510-2102

Honorable John F. Kerry  
United States Senator  
One Bowdoin Square  
Tenth Floor  
Boston, MA 02114

Honorable Richard E. Neal  
House of Representatives  
Washington, DC 20515-2102

Honorable Richard E. Neal  
Representatives in Congress  
1550 Federal Building  
Springfield, MA 01103

Honorable John W. Olver  
House of Representatives  
Washington, DC 20515-2101

Honorable John W. Olver  
Representative in Congress  
187 High Street  
Holyoke, MA 01040



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02254-9149



September 30, 1996

## PUBLIC NOTICE

### INITIATION OF A MASTER PLANNING STUDY CONANT BROOK DAM MASSACHUSETTS

The U.S. Army Corps of Engineers, New England Division, has initiated a study to update the existing Master Plan at its Conant Brook Dam flood control project. The project is located on Conant Brook in south central Massachusetts. The dam and reservoir area, shown on the attached map, are located in the community of Monson.

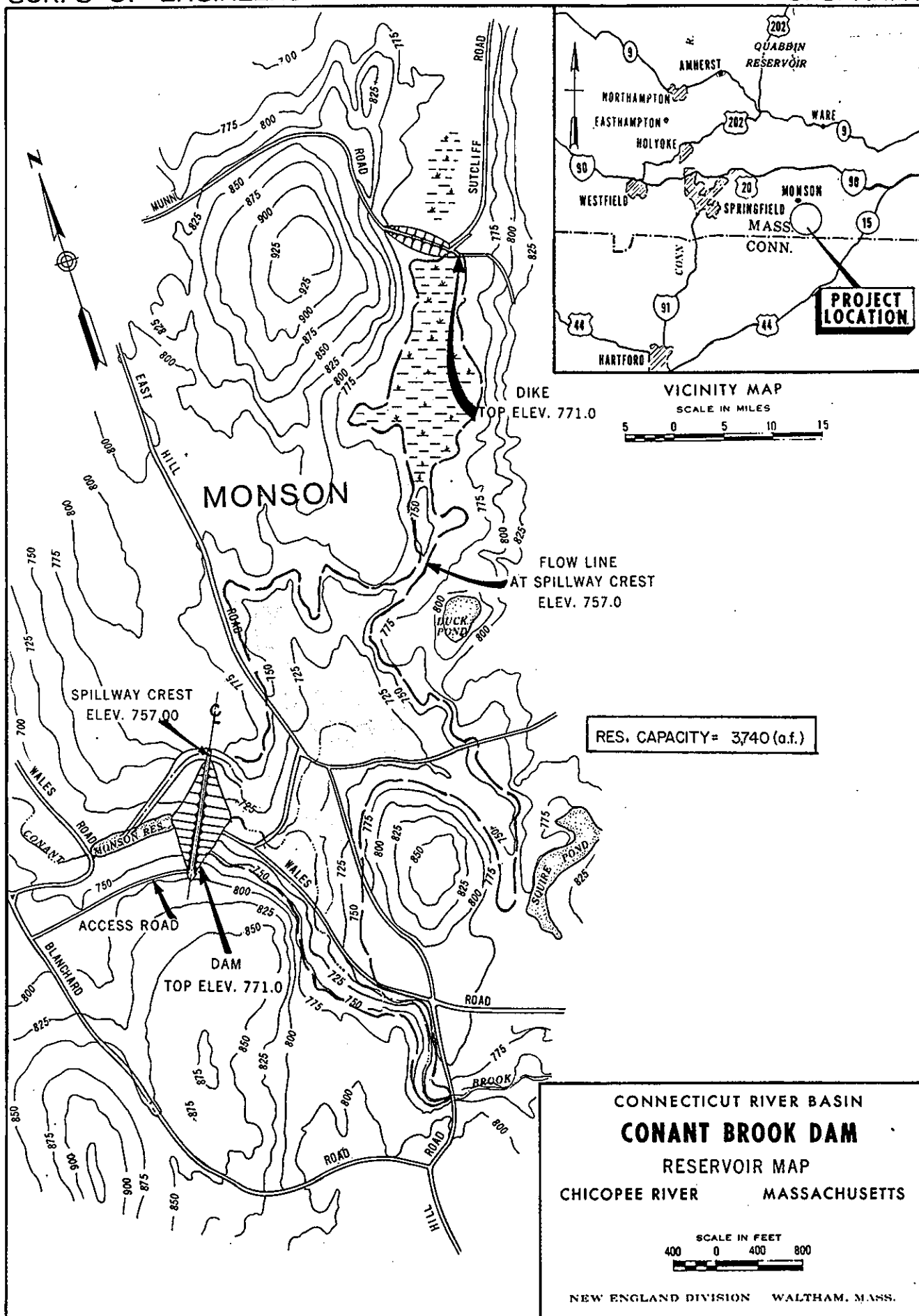
The purpose of the study is to assess the natural and manmade resources of the project, determine regional needs and public desires, and develop an overall land and water management plan for the project.

At this time, we are requesting input from public officials, concerned citizens, and others that may be able to provide information or assistance in updating the Master Plan. If you are able to provide this type of assistance, please contact the Study Manager, Richard Heidebrecht, at (617) 647-8513, or at the following address:

U.S. Army Corps of Engineers  
Formulation Division  
ATTN: Richard Heidebrecht  
424 Trapelo Road  
Waltham, MA 02254-9149

J. Michael Bradbury  
Lieutenant Colonel, Corps of Engineers  
Deputy Division Engineer

Attachment





**US Army Corps  
of Engineers**  
New England Division

# News Release

Release No. 96-201  
For Release: Upon Receipt

Contact:  
Sue Douglas  
Phone: 617-647-8264

424 Trapelo Road, Waltham, MA 02254-9149  
September 30, 1996

## Conant Brook Dam Master Plan Update

WALTHAM, Mass. -- The management plan for 471 acres of land and water surface area at the Conant Brook flood control project in south-central Massachusetts is being updated by the U.S. Army Corps of Engineers. To assist in developing an updated master plan, the Corps' New England Division is requesting input from public officials, concerned citizens, and others who may be able to provide information or assistance.

Conant Brook Dam is located about two miles southeast of the center of Monson on Conant Brook, a tributary of the Chicopee River. The dam provides flood protection to Monson and communities along the Quaboag and Chicopee rivers.

The project lands encompass Duck Pond, a one-half acre natural pond that contains Golden Club, a rare aquatic plant. In cooperation with the Massachusetts Natural Heritage Conservation Program, the pond and its perimeter have been designated a "Natural Area" to protect this plant.

Recreational opportunities include stream fishing for state-stocked and native trout along both Conant and Vinica brooks. Hunters will find state-stocked pheasant and native deer, rabbit, and other small game. More than a mile of old roads also provide scenic trails for hiking, cross-country skiing and horseback riding.

The Conant Brook project incorporates a 1,050-foot-long, 85-foot-high earthdam dam and a 980-foot-long earthfill dike with a maximum height of 14 feet. Completed at a cost of \$3 million in 1966, the dam can impound a 158-acre reservoir capable of storing 1.2 billion gallons of water.

Anyone wishing to provide input may do so by contacting Richard Heidebrecht at the New England Division, U.S. Army Corps of Engineers, 424 Trapelo Road, Waltham, MA 02254-9149, telephone 617-647-8513.



## Appendix B

### Wetland Community Description

## WETLAND COMMUNITY DESCRIPTION

### Conant Brook Project

The acetate wetland map was assembled from black and white 1:12,000 aerial photographs taken on April 14, 1992 and interpreted with a 4X stereoscope primarily by Janice Stone on November 12, 1992. These photographs represent early spring flow conditions whereas field verification was completed June, 1996 under a late spring/early summer flow regime. The USGS Topographical Map for this area was also useful collateral information.

The wetlands were classified utilizing a schema which is from Cowardin et al. (1) with modifications and is described in Table 1. The acres of wetlands calculated for each category is described in Table 2.

In an attempt to simplify the process of wetland community description, Conant Brook Flood Control Project was divided into three areas:

1. the wetland communities in the northern portion of the Project, outlined by East Hill, Munn and Stanton Roads,
2. the wetland communities in the southeastern portion of the Project which includes drainage from Squire Pond and Vinca Brook,
3. the wetland communities adjacent to the dam where the drainages from 1 and 2 above flow into the basin and the discharge area just below the dam.

The area indicated by (1) begins at the most northern extent of the Project at the dike on which Munn Road is located. The extensive Palustrine wetland originates just south of the dike and receives visible drainage from under the dike and from at least four small intermittent brooks which drain from the west facing hillside. Within the past two weeks these streams have dried, but there is a well defined channel bordered with varying amounts of emergent nonpersistent vegetation, primarily skunk-cabbage (Simplocarpus) and false hellebore (Veratrum). There was no visible inflow into this wetland from the east facing hillside. This entire wetland area originates from behind a three to four foot structure upon which beaver have constructed an approximately three foot dam. This beaver dam is indicated on the acetate map. It is difficult to determine whether the beaver dam was constructed in 1992 when the aerial photographs were taken but the effect of the increased water level on the vegetation is evidenced by the extensive death of trees except at the edges of the wetland. This beaver dam, being constructed on a historical structure, has sufficiently raised the water level to modify the Palustrine from forested to scrub/shrub as well as modify the other wetland types toward the aquatic bed class. The Palustrine forested, mostly broad leaved deciduous consisting of red maple (Acer), is mostly relegated to the edges of the wetland. Most of the red maple away from the edges are dead, many being uprooted. There are patches of dead white pine (Pinus strobus) some still possessing brown needles which indicates recent increases in water level raising soil saturation levels beyond which this facultative needle-leaved evergreen can tolerate. There is a small stand of Palustrine needle-leaved evergreen forest,

TABLE 1  
Wetland Classification System for Conant Brook Dam

### PALUSTRINE SYSTEM

- POW open water, less than 20 acres
- PAB1 aquatic bed vegetation, rooted vascular (water lily/shield)
- PAB2 aquatic bed vegetation, floating vascular (coontail, duckweed)
- PEM1 emergent vegetation, persistent (cattail, sedge)
- PEM2 emergent vegetation, nonpersistent (pickerelweed, arrowhead)
- PM moss wetland (Sphagnum)
- PSS1 broad-leaved deciduous (alder)
- PSS2 needle-leaved deciduous (tamarack)
- PSS3 broad-leaved evergreen (labrador tea)
- PSS4 needle-leaved evergreen (black spruce)
- PF01 broad-leaved deciduous (red maple)
- PF02 needle-leaved deciduous (larch)
- PF04 needle-leaved evergreen (Atlantic white cedar)

### RIVERINE SYSTEM

- R open water contained within a channel
- RAB1 aquatic bed vegetation, rooted vascular, in system (water lily/shield)
- RAB2 aquatic bed vegetation, floating vascular, in system (coontail, duckweed)
- REM1 emergent, persistent vegetation in system (cattail)
- REM2 emergent, nonpersistent vegetation (pickerelweed)

### NON-WETLAND

- U upland

### MODIFIERS

- \* area dominated by Sphagnum and the associated bog community
- ^ marsh or area characterized by emergent vegetation which is semipermanently flooded
- + wet meadow or area characterized by persistent emergent vegetation which is seasonally flooded
- o standing, mostly dead deciduous/evergreen forest
- intermittent stream
- VP? possible vernal pool

primarily white pine, on the west facing shore of this wetland, and a small stand of cottonwood (Populus deltoides) at the northern edge of the wetland, visible from the dike. Also at the northern edge is an emergent persistent wetland, consisting of an unidentified sedge (Carex). Occupying much of the central portion of this area, extending to the west shore is a scrub/shrub area consisting primarily of highbush-blueberry (Vaccinium corymbosum), black alder (Ilex verticillata) and red osier dogwood (Cornus stolonifera). The greatest area of this wetland is classified Palustrine aquatic bed with floating vascular vegetation. This area is given a modifier, o, indicating there are many standing dead trees. Also present is a limited amount of scrub/shrub vegetation. The dominant vegetation of the northern portion of the PAB2o is a member of the duckweed family, Spirodela. The more southern portions of the PAB2o, terminating at the beaver dam, the aquatic bed vegetation is Utricularia. The Utricularia was in bloom which provided this portion of the wetland with a striking yellow cover. For about 100 yards downstream of the beaver dam, the discharge from this wetland passed through a series of meandering, widened areas in the stream with water shield (Brasenia) along the edges. As this unnamed stream flows south, it becomes more riverine within a 2-3 foot channel with a gravel/coarse sand substrate with moss/liverwort stabilized banks. This Riverine area is surrounded with a Palustrine needle-leaved evergreen forest. As this riverine system approaches the wetland formed by the culvert under historical Stanton Road, it possesses nonpersistent emergent vegetation, primarily skunk cabbage and false hellebore.

Just east of the small parking area adjacent to Munn Road is a depression about 100 feet in diameter. This is a probable vernal pool with a scrub/shrub interior, PSS1 (Alder), surrounded by a PF01 consisting primarily of red maple.

About 20 feet to the east of the middle hiking trail, between the Riverine area draining the extensive Palustrine wetland described above and Duck Pond is a depression containing another probable vernal pool about 75x100 feet, a PF01, also dominated by red maple. The bottom of this pool was carpeted with larval amphibians.

Duck Pond is situated adjacent to the eastern Project boundary. Duck Pond is contained in a well defined depression with no visible inflow or outflow. Although the sides of this depression are fairly steep, most of its water supply is provided by ground water, with the deepest portion of Duck Pond estimated to be no more than 3.5 to 4.0 feet. This deepest, centrally located area is Palustrine with yellow water lily (Nuphar) and water-shield forming the aquatic bed vegetation. Peripheral to this centrally located area is a well defined circular area of golden club (Orontium aquaticum). Golden club may be considered rare in Massachusetts. Another constituent of the nonpersistent emergent vegetation is pickerelweed. Peripheral to the PEM2, closer to the shore, is PEM 1^, an extensive area which is semipermanently flooded and consists primarily of barnyard-grass (Echinochloa), with lesser amounts of sedges and cattails. The steep-sided edges of Duck Pond were primarily PF01, consisting of red maple with an understory of a laurel.

The final wetland area in this first compartment is in the general vicinity of the historical East Hill Road. Drainage from outside Corps property forms a Palustrine forest of red maple which

surrounds 75x100 foot Palustrine, nonpersistent emergent vegetation consisting primarily of skunk cabbage and arrowhead (Sagittaria). About 100 feet south of this area is an isolated pool about 100 feet in diameter which is probably a vernal pool. There was no visible drainage in or out of this pool. A narrow fringe of Palustrine forest with red maple dominant surrounded this pool. In this vicinity several wet areas characterized as PF01 joined forming a intermittent stream which merged with the drainage from the extensive wetland just above the culvert which crosses historical Stanton Road. Another completely isolated wetland is adjacent to the northwest boundary. This area might also be a vernal pool. It is approximately 200x100 feet and in the central area is classified as Palustrine scrub/shrub with no evidence of aquatic bed vegetation. It is surrounded with a Palustrine broad leaved deciduous forest.

The second general compartment of wetlands to be described at Conant Brook is in the southeastern portion of the Project. It consists of the area of inflow of Vincia Brook and drainage associated with Squire Pond. Vincia Brook enters the Project boundary by a culvert under Wales Road into a steep sided ravine. In this area Vincia Brook is a typical well channelized, Riverine class with an approximately 3:1 ratio of riffle/pool. The banks were well stabilized and forested with eastern hemlock and red maple. In the center of a couple of pools in this area are pockets of emergent persistent vegetation, primarily (Carex). Emergent vegetation on the banks in this area is limited, except in the area where the gas pipeline traverses beneath Vincia Brook. In this area the Riverine class has a thick persistent emergent growth of sedges on the banks (Carex). As Vincia Brook exits the culvert beneath the historical Wales Road, it enters a complex Palustrine system. The channel widens in excess of 15 feet with beds of nonpersistent emergent vegetation within the streambed. On the east facing shore is a deciduous Palustrine forest with several shallow pools containing ground water probably draining from the upland. There are pockets of persistent emergent vegetation surrounding these pools. These pools contained many strings of salamander eggs. The west facing bank of Vincia Brook in this area is Palustrine scrub/shrub (PSS1) consisting of stunted marsh cottonwood and red maple with a dense understory of alder and silky willow (Salix sericea). This Palustrine scrub/shrub consisting of broad leaved, woody shrubs fringes the historical Wales Road within the basin extending to the edge of the dam. In this fringing area the overstory disappears and only the alder and willow remain. Vincia Brook meanders through this PSS1 and emerges into a fairly extensive area of persistent emergent vegetation consisting of distinct clusters of tussock sedge (Carex stricta) and cattails. Where Vincia Brook joins drainage from the other wetlands, it has formed a delta with the branches of the brook bisecting patches of persistent emergent vegetation. At this point Vincia Brook merges with the other unnamed inflows forming Conant Brook.

The other source of drainage from this southeastern quadrant of the Project is formed from a wet meadow and from two outflows from Squire Pond. Squire Pond is a shallow, no more than 4-5 feet in depth, person-made structure, two-thirds of which is within Corps boundary. This drainage area is modified by beaver activity and all terrain vehicle activity associated with the steep slopes of the natural gas pipeline right of way. The wet meadow area, PEM1+, is at the base of an old field. This wet meadow is characterized by the woolly sedge (Scirpus cyprinus) and the sensitive fern (Onoclea sensibilis). At the edge of the wet meadow a barbed wire fence which separates PEM1+ from PF01. The wet meadow has been maintained in this stage of succession

by mowing. The Palustrine forest is dominated by red maple and swamp oak (*Quercus palustris*), with an understory of hummocks populated with ostrich fern (*Pteris pensylvanica*). This area terminated in a large pool formed by a beaver dam. The lower portion of this pool is PF01o. Flowing into this area from the east is one of the two drainages from Squire Pond. This PF01 has a understory of skunk cabbage, ostrich fern, marsh marigold (*Caltha palustris*) and a ground cover of goldthread (*Coptis groenlandia*). Toward the area of the beaver dam there is a small PM with *Sphagnum*, probably due to the damming influence. The beaver activity extends down the valley creating several small pools beneath the PF01, red maple, canopy. There is much beaver activity surrounding Squire Pond, with beaver dams constructed over the two spillways. There are two areas of needled evergreen Palustrine forest on the north shore of Squire Pond with eastern hemlock the dominant cover. Squire Pond is a turbid, shallow, highly stained Palustrine aquatic bed with rooted vascular yellow water lily and water shield. With the exception of a small area, there is no emergent vegetation at Squire Pond. The second more northern discharge from Squire Pond flows through PF01, along the edge of the gas pipeline where it joins the first discharge. A beaver dam is constructed at the edge of the pipeline creating a PF01o. Since the slope of the gas pipeline on either side of this area where the unnamed stream crosses is severe and A.T.V. activity has removed all cover from the severe slopes, there is serious silting into the stream creating a PAB1 surrounded by a PEM1 within the gas pipeline right of way. On the downstream side of the pipeline there are a couple of beaver dams which create PF01, with red maple overstory. These beaver dams are serving as mini-siltation basins, capturing silt washed into the stream from erosion of the gas pipeline right of way. In the vicinity of the culvert where this drainage from Squire Pond flows under the historical Stanton Road, the wetland becomes REM1, with tussock sedge the persistent, dominant emergent vegetation. On the downstream side, the Riverine system flows into a PF01, primarily red maple, with a nonpersistent ground cover.

The third compartment described is composed of three wetland areas; the first two created by culverts placed under historical roads and the third is a small pool at the base of the dam. The discharge and a small stream in the vicinity of the discharge is also included in this compartment. The first wetland receives drainage from all the inflows except Vincia Brook. It has been recently modified by beaver activity. On the recently flooded edges of this wetland it is classified as primarily PF01 and PF04. More toward the center of this wetland the Palustrine forest merges with Palustrine scrub/shrub (PSS1^o), the standing dead coniferous and deciduous trees probably indicative of a relatively recent increase in water level due to beaver activity. The outer fringes of this area is dominated by alder and the inner area by meadow sweet, *Spiraea*. There is a dense growth of willow extending along either side of the road, with recent beaver activity indicated by the dammed culvert and the stream overflowing the road. A small amount of persistent emergent vegetation (cattails) is beginning to colonize the deeper areas around the beaver dam. A small PF01 with a PSS1 at the outlet is contained at the junction of historical Stanton and Moulton Hill Road.

These areas flow through a culvert under historical Stanton Road into the intermediate wetland area in front of the flood control dam. This wetland also receives the inflow of Vincia Brook described above. It is demarcated by historical East Hill Road on the west, by historical Stanton Road on the north, by historical Moulton Hill Road on the east, and by historical Wales

Road on the south. The southeastern portion of this area was described with Vincia Brook. The eastern border of this area is Palustrine forest, mostly dominated by red maple although there are a couple of pockets of eastern hemlock. Probably more than 50% of this area is PSS1 dominated by willow and common elder (Sambucus canadensis) growing in an impenetrable tangle along the eastern edge and a mix of alder, willow and meadowsweet dominating in other areas and PEM1 dominated by cattails and sedge, especially hummocks crowned with tussock sedge. This entire area was populated by water fowl. An unique area of interest is a PM\* which is about 200x100 feet, adjacent to historical East Hill Road. In contrast to the PM\* described in the drainage of Squire Pond, this PM\* contains an assemblage of flora typically associated with the bog community including a thick mat of Sphagnum, round-leaved sundew (Drosera rotundiflora), American cranberry (Vaccinium macrocarpon), and marsh St. John's-wort (Hypericum virginicum). The scrub/shrub and emergent areas dominating this wetland become aquatic bed in the vicinity of the inflow of Vincia Brook. The pool containing rooted aquatic vegetation, primarily water shield and yellow water lily, is created by the culvert associated with historical East Hill Road. This PAB1 area is a popular fishing spot.

At the base of the dam is the third wetland bisected by the logboom, and the discharge which passes through the weir. In the central area of this 4-5 foot pool, the PAB1 is dominated by water shield and yellow water lily. Traversing toward the shore, the PEM1^ is dominated by the beaked spike-rush (Eliocharis rostellata), the three-way sedge (Dulichium arundinaceum), and the tussock sedge. Toward the south facing shore the PSS1 was dominated by alder. The discharge is highly modified by riprapping and classified as RAB1, surrounded by a narrow PEM1 due to the patches of cattail growing on silt deposits.

The discharge, Conant Brook, is into a Palustrine open water wetland created by a spillway downstream which is just beyond Project boundaries. This open water area must be steep-sided since no emergent vegetation was visible although there was PAB1, primarily water shield, visible as a thin fringe along the edge in certain areas of the pool.

The final wetland area is a small Riverine area (probably intermittent) which originates beyond Corps boundaries and crosses in a south to north direction via a culvert under the access road to the observation area at the top of the dam and then exits the Project boundary. Of interest is the inflow of several springs into this small stream which have a high concentration of iron in the reduced form (ferrous) which when coming in contact with the air is oxidized to the ferric form, causing a large mound of iron oxide at the site as well as staining the stream bed red. Also of interest is the large amount of iron bacteria growing on the surface of the spring water creating an iridescent film on the surface of the water.

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TABLE 2  
Wetland Acreage for Conant Brook Dam

PALUSTRINE SYSTEM

Open Water, Less Than 20 Acres	0.8 acres
Aquatic Bed Vegetation, rooted vascular	5.1 acres
Aquatic Bed Vegetation, floating vascular	16.8 acres
Emergent Vegetation, persistent	10.1 acres
Emergent Vegetation, nonpersistent	2.4 acres
Moss Wetland	0.5 acres
Shrub-Scrub Broad-Leaved Deciduous	15.4 acres
Forested Broad-Leaved Deciduous	13.4 acres
Forested Needle-Leaved Evergreen	1.6 acres
TOTAL	66.1 ACRES

RIVERINE SYSTEM

Open Water Contained Within A Channel (miles)	1.5 miles
Aquatic Bed Vegetation, rooted vascular	0.5 acres
Emergent Vegetation, persistent	1.6 acres
Emergent, nonpersistent	1.1 acres
Intermittent Stream (miles)	1.2 miles
TOTAL	3.2 ACRES
TOTAL	2.7 MILES

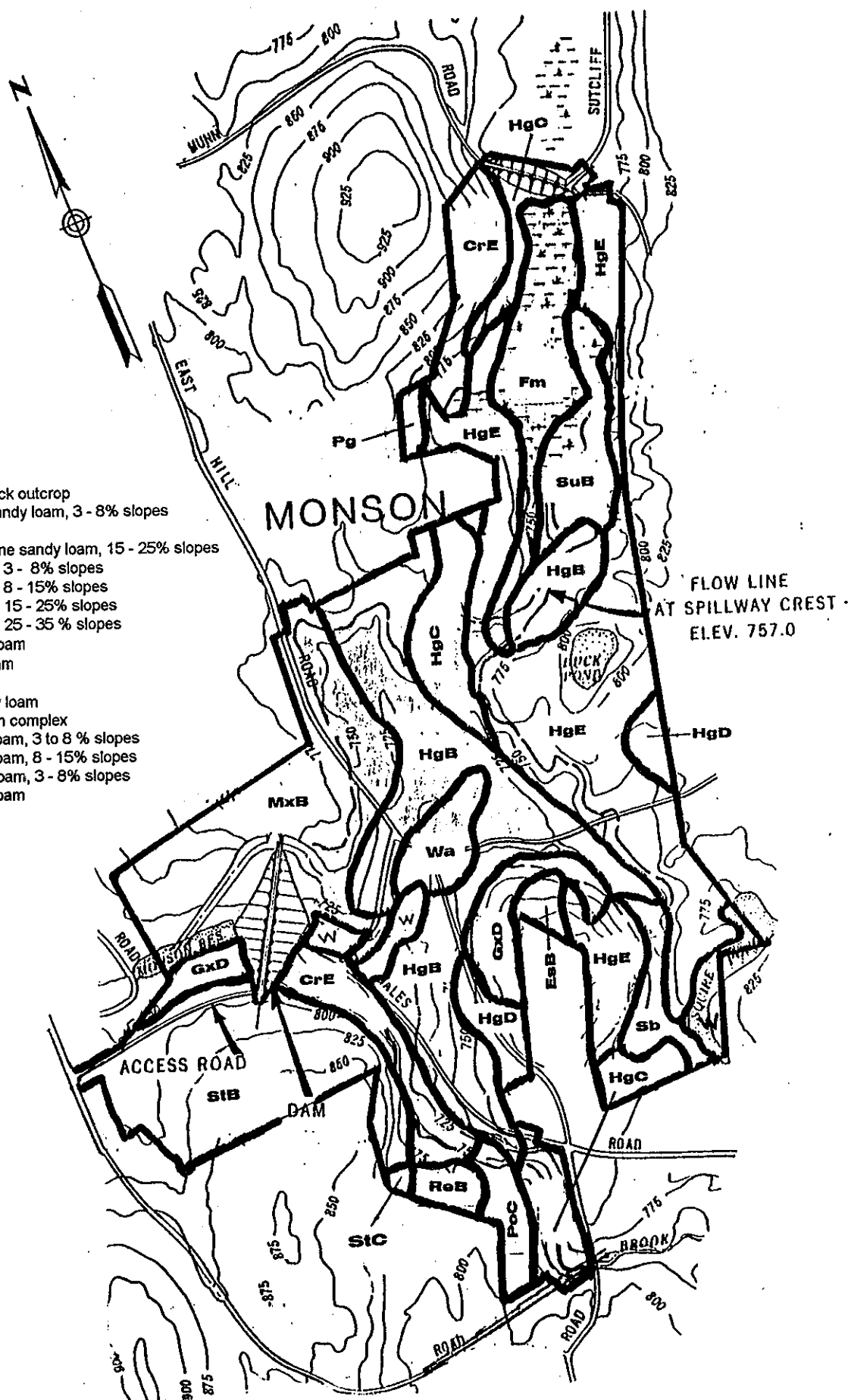


## Appendix C

### Soil Map and Soil Suitability Information

SYMBOL NAME

CrE	Charlton - Hollis - Rock outcrop
EsB	Essex gravelly fine sandy loam, 3 - 8% slopes
Fm	Freetown muck
GxD	Gloucester gravelly fine sandy loam, 15 - 25% slopes
HgB	Hinckley loamy sand, 3 - 8% slopes
HgC	Hinckley loamy sand, 8 - 15% slopes
HgD	Hinckley loamy sand, 15 - 25% slopes
HgE	Hinckley loamy sand, 25 - 35 % slopes
MxB	Montauk fine sandy loam
PcC	Paxton fine sandy loam
Pg	Pit, gravel
ReB	Ridgebury fine sandy loam
Sb	Scarboro - Rippowam complex
StB	Scituate fine sandy loam, 3 to 8 % slopes
StC	Scituate fine sandy loam, 8 - 15% slopes
SuB	Sudbury fine sandy loam, 3 - 8% slopes
Wa	Walpole fine sandy loam
W	Water



## CONANT BROOK DAM

### DETAILED SOIL MAPPING

(Source: 1989 SCS Soil Survey)

Table C-1

Soil Suitability at Conant Brook Dam

Map Symbol	Picnic Areas	Paths and Trails	Playgrounds	Camp Areas	Local Roads
CrE	Severe: slope, large stones, depth to rock	Moderate: slope	Severe: large stones, slope, depth to rock	Severe: slope, large stones, depth to rock	Severe: slope, depth to rock
EsB	Moderate: wetness, large stones	Moderate: wetness	Severe: large stones	Moderate: large stones, wetness	Moderate: wetness
Fm	Severe: wetness, excess humus	Severe: wetness, excess humus	Severe: wetness, excess humus	Severe: wetness, excess humus	Severe: wetness, low strength, frost action
GxD	Severe: slope, large stones	Moderate: large stones, slope	Severe: slope, large stones, small stones	Severe: slope, large stones	Severe: slope
HgB	Slight	Moderate: too sandy	Moderate: slope, small stones	Slight	Slight
HgC	Moderate: slope	Moderate: too sandy	Severe: slope	Moderate: slope	Moderate: slope
HgD	Severe: slope	Moderate: too sandy, slope	Severe: slope	Moderate: slope	Severe: slope

Table C-1 (con't)

## Soil Suitability at Conant Brook Dam

Map Symbol	Picnic Areas	Paths and Trails	Playgrounds	Camp Areas	Local Roads
HgE	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope
MxB	Severe: large stones	Moderate: large stones	Severe: large stones, small stones	Severe: large stones	Moderate: wetness, large stones
PcC	Severe: large stones	Slight	Severe: large stones, slope	Severe: large stones	Moderate: wetness, slope, frost action
ReB	Severe: large stones, wetness, percs slowly	Severe: wetness	Severe: wetness, large stones, small stones	Severe: large stones, wetness, percs slowly	Severe: wetness, frost action
Sb	Severe: ponding, wetness	Severe: ponding, wetness	Severe: ponding/flooding, wetness	Severe: ponding/flooding, wetness	Severe: ponding/flooding, wetness, frost action
StB	Severe: large stones	Moderate: wetness	Severe: large stones, small stones	Severe: large stones	Moderate: wetness, frost action
StC	Severe: large stones	Moderate: wetness	Severe: slope, large stones, small stones	Severe: large stones	Moderate: wetness, slope, frost action

**Table C-1 (con't)**

**Soil Suitability at Conant Brook Dam**

Map Symbol	Picnic Areas	Paths and Trails	Playgrounds	Camp Areas	Local Roads
SuB	Moderate: wetness	Slight	Moderate: slope, wetness, small stones	Moderate: wetness	Moderate: wetness, frost action
Wa	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness, frost action